

XIX CONFERENCE OF ITALIAN RESEARCHERS IN THE WORLD

BRUSSELS ~ MAY 23, 2025



Senato della Repubblica



Camera dei Deputati



MINISTERO DELLA DIFESA



Ministero delle Imprese e del Made in Italy



Ambasciata d'Italia Bruxelles



Istituto Superiore di Sanità





Message from the Conference Chairman

Cari partecipanti,
è con profondo piacere e sincero apprezzamento che porgo il mio saluto a tutti voi, riuniti oggi per la XIX Conferenza dei Ricercatori Italiani nel Mondo, un appuntamento di straordinaria rilevanza.

Desidero esprimere la mia gratitudine al Presidente del Parlamento Europeo, Roberta Metsola, al Vicepresidente, Antonella Sberna, e al Parlamento Europeo per la generosa ospitalità. Un sentito ringraziamento va altresì al Vice Rettore dell'Université Libre de Bruxelles, Anne Weyembergh, al Presidente della Texas Scientific Italian Community, Andrea Giuffrida, al coordinatore dell'evento, Antonio Cenini, ai membri del comitato organizzatore, i Professori Boccaletti, Carletti, Napolitano e Tlidi, per il loro impegno.

Portare questa iniziativa, sotto l'alto patrocinio del Parlamento Europeo, dal Nord America al cuore dell'Europa rappresenta un traguardo significativo, testimoniato dal sostegno di prestigiose istituzioni italiane ed europee, il Senato della Repubblica, la Camera dei Deputati, la Presidenza del Consiglio dei Ministri, i Ministeri della Difesa, dell'Università e della Ricerca, degli Affari Esteri e della Cooperazione Internazionale, della Salute, delle Imprese e del Made in Italy, nonché l'Istituto Superiore di Sanità, e l'Enea. Un ringraziamento particolare all'Ambasciatore d'Italia in Belgio, Federica Favi, e al Console Varriale, per la loro presenza e supporto.

La Conferenza offre un programma ricco con tematiche su aerospazio, stem, medicina e scienze umanistiche, affrontando temi come l'Intelligenza Artificiale, la robotica, e il ruolo delle associazioni dei ricercatori italiani all'estero. Relatori e Moderatori di fama internazionale, stimoleranno un dibattito aperto e costruttivo.

Questa edizione ci invita a riflettere su questioni di primaria importanza, in particolare la valorizzazione del capitale umano italiano all'estero e il rafforzamento del sistema della ricerca scientifica. L'investimento nella ricerca rappresenta una priorità strategica per l'Italia, l'Europa, ed il mondo, indispensabile per contrastare la mobilità internazionale non equilibrata dei talenti e accrescere la competitività globale. Le linee d'azione prioritarie includono: un significativo incremento delle risorse pubbliche e private destinate alla ricerca; la stabilizzazione dei ricercatori attraverso contratti a lungo termine, salari competitivi e percorsi di carriera basati sul merito; il consolidamento delle sinergie tra università, enti di ricerca e imprese per trasformare la conoscenza in innovazione; la modernizzazione delle infrastrutture scientifiche; la semplificazione delle procedure amministrative; e il pieno utilizzo di programmi europei come Horizon Europe per finanziare progetti e promuovere la mobilità internazionale.

La fuga dei talenti, con circa 120.000 ricercatori italiani attivi all'estero – di cui circa 15.000 negli Stati Uniti – comporta per l'Italia una perdita economica stimata in 134 miliardi di euro negli ultimi tredici anni, cui si aggiungono 4,5 miliardi di euro investiti nella formazione di professionisti che scelgono di operare oltre confine. Per invertire questa tendenza, è essenziale adottare politiche coordinate e lungimiranti a livello nazionale ed europeo, creando un ecosistema della ricerca attrattivo, inclusivo e sostenibile.



Tuttavia, mentre negli Stati Uniti si rileva una preoccupante contrazione dei finanziamenti alla ricerca, con potenziali ripercussioni sul progresso tecnologico, l'Italia sta compiendo passi significativi nella giusta direzione. Un esempio è l'iniziativa promossa dal Ministero dell'Università e della Ricerca, e dal Governo italiano, che ha stanziato 50 milioni di euro per potenziare le infrastrutture scientifiche e incentivare il rientro dei ricercatori dall'estero.

Investire nelle giovani generazioni, promuovere connessioni internazionali e sostenere chi dedica la propria vita alla scienza non è solo una scelta strategica, ma un imperativo per il futuro. Questa Conferenza rappresenta un'occasione unica per rafforzare questi obiettivi, valorizzando il contributo dei ricercatori italiani al progresso scientifico globale. Al centro del nostro impegno restano il dialogo e la ricerca, pilastri fondamentali per costruire un'Europa e un'Italia innovative, competitive e protagoniste sulla scena internazionale.

Grazie a tutti voi per il contributo che date quotidianamente.

Con stima e ammirazione,

Handwritten signature of Vincenzo Arcobelli.

Vincenzo Arcobelli



TEXAS
SCIENTIFIC
ITALIAN
COMMUNITY

ULB UNIVERSITÉ
LIBRE
DE BRUXELLES



Vice President

Brussels, 23 May 2025

Subject: Address by EP Vice-President Sberna – 19th Conference of Italian Researchers Worldwide

Good morning and thank you for the invitation to address this important conference.

Although I cannot be with you in person due to commitments in Italy, I want to warmly welcome you on behalf of the European Parliament and express my appreciation for the incredible work Italian researchers are doing around the world.

I would like to acknowledge the visionary leadership of Vincenzo Arcobelli, whose commitment has helped foster collaboration among researchers and strengthen ties with institutions and policymakers.

This 19th edition of the conference—supported by the Texas Scientific Italian Community, Université Libre de Bruxelles, the General Council for Italians Abroad, and our outstanding Ambassador in Belgium, Ms. Favi—stands as proof of the valuable synergies being built internationally.

Research and innovation are central to Europe's competitiveness, particularly as we navigate a turbulent geopolitical climate and complex socio-economic challenges. Strengthening the Union's research and innovation ecosystem is essential.

Unfortunately, many Italian researchers have left the country due to limited career opportunities, lack of merit-based advancement, and bureaucratic obstacles that make returning difficult. Early-career researchers often face short-term contracts and job insecurity, while those working abroad risk becoming disconnected from Italian and EU institutions.

To reverse these trends and retain talent, the EU must take decisive action:

1. Standardize research careers and ensure that benefits like pensions and healthcare are portable across member states to promote mobility and job security.
2. Simplify and expand access to Horizon Europe funding, preserving it as a standalone program separate from broader budget instruments to ensure stability and focus.
3. Improve institutional policies on work-life balance, dual careers, mental health, and gender equality to enhance quality of life and make the research profession more inclusive and sustainable.

I also want to highlight Italy's candidacy to host the Einstein Telescope, a major future European gravitational wave observatory. This project will elevate our scientific standing and open new opportunities in frontier research, and I hope to count on your support and that of our European partners.

Thank you all for the passion and excellence you bring to your work. Your contributions make Italy proud, and we hope to create the conditions that allow you to one day return. Wishing you a productive and inspiring conference.

Best regards,

Antonella Sberna
Vice President of the European Parliament

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Opening Remarks – XIX Conference of Italian Researchers in the World **By Anne Weyembergh, Professor of EU law and Vice-Rector for International Relations and Cooperation, Université libre de Bruxelles (ULB)**

Ambassador Federica Favi,
 Distinguished guests,
 Ladies and Gentlemen,
 Cari ricercatori e cari colleghi,

As Vice-Rector for International Relations at the Université libre de Bruxelles, it is a true pleasure and honour to open this 19th Conference of Italian Researchers in the World, and this for two main reasons that deeply resonate with the DNA of my university, the Université Libre de Bruxelles (ULB).

First, cutting-edge research lies at the very heart of ULB's mission, as is in particular shown by the most prestigious scientific prizes ULB academics/researchers have won, including 4 Nobel prizes in science (Jules Bordet (1919), Albert Claude (1974), Ilya Prigogine (1977), François Englert (2013)). Our university is deeply rooted in the principle of free inquiry — le libre examen — a founding value that champions freedom of thought, independent judgment, and a critical approach to knowledge. It entails the rejection of arguments based solely on authority, in favour of reason, evidence, and open debate.

Since its founding, ULB has stood firmly as an « Université engagée », consistently at the forefront of efforts to promote and defend academic freedom and the freedom to conduct research. Yet, as the current global context sadly reminds us, these freedoms can never be taken for granted. Safeguarding them is a collective responsibility — and gatherings like this one are a powerful reminder of our shared commitment to that vital cause.

The second reason why it is a true pleasure and an honour to open this event lies in the strong and enduring ties between ULB and Italy — ties that are both institutional and personal. ULB is a profoundly international and intercultural university. Around one third of both our staff and our student body comes from abroad. In 2024, 158 staff members at ULB were Italian nationals — including professors and researchers — making Italy our second most represented non-Belgian nationality. On the student side, we currently have 745 Italian students enrolled for the 2024–2025 academic year, placing Italy as the third most represented foreign nationality within our student community. Beyond the numbers, our collaboration with Italian institutions is rich, dynamic, and multifaceted:

- This strong connection is clearly reflected in student mobility: ULB currently has 42 Erasmus exchange agreements with Italian universities. Italy is the second most frequent country of origin for incoming Erasmus students to ULB, and the third most popular destination for our outgoing students.
- The strength of our ties is also evident in the field of joint teaching programmes, with Italy ranking second among our partner countries. I could cite many examples, but let me highlight just a few: dual degrees in Engineering with Politecnico di Milano through the TIME network, and programmes in Political Science or Business with LUISS Guido Carli in Rome, among others.



- Our collaboration also thrives in research. This is true at both the institutional level — as shown by our joint participation in several Horizon Europe projects — and at the individual level, which result in many co-authored publications and numerous co-supervised or double and even triple PhD theses.
- A last word finally to insist on the very close, interdisciplinary and multifaceted relation of collaboration with Sapienza University through our CIVIS European University alliance.

This rich web of collaborations and shared ambitions with our Italian partners reflects a core belief of ours: that science knows no borders — and that strong scientific and academic partnerships are essential pillars in addressing the many societal and geopolitical challenges we face today, in Europe and beyond.

Let me therefore warmly thank all of you — researchers, organisers, and partners — for being here today, for advancing knowledge through dialogue and exchange, for fostering mutual trust, and for contributing to the construction of a more resilient and hopeful world.

I wish you all a truly inspiring and fruitful conference.

Grazie mille per l'attenzione.

Prof. Anne Weyembergh



Andrea Giuffrida, PhD, MBA

President, Texas Scientific Italian Community

Senior Vice President for Research & Biotechnology
Western University of Health Sciences, Pomona, CA

Dear Colleagues,

On behalf of the Texas Scientific Italian Community and the organizing committee, it is a great honor to welcome you to the XIX Conference of Italian Researchers in the World.

This year, we are especially proud to host the conference at the European Parliament in Brussels, a historic place that is a symbol of the ideals of unity, dialogue, and international cooperation. I cannot think of a better venue to celebrate the remarkable achievements, creativity, and global impact of Italian researchers, and their unparalleled ability to foster cross-border partnerships.

Now in its 19th edition, this conference continues to embody the spirit of scientific exchange that transcends geographical borders and discipline boundaries. Italian scholars, as highlighted throughout our program, are making meaningful contributions across multiple fields, affirming the enduring excellence of our global scientific community.

We are privileged to be joined by Vice President of the European Parliament, Antonella Sberna, Vice Rector, Anne Weyembergh, and many other distinguished guests from European institutions, Italian diplomatic missions, academia, and international associations of Italian researchers. We are especially grateful to Federica Favi, Ambassador of Italy in Belgium, for her participation opening remarks.

Our deepest thanks go to Conference Chair, Vincenzo Arcobelli, as well as to the numerous national and international associations attending the event, including the Associations of Italian Researchers in Australia, Israel, France, the United Kingdom, Belgium, and Mexico. Your presence highlights the global strength and prestige of this annual gathering, which has grown into a premier platform for scientific dialogue and collaboration.



We extend heartfelt appreciation to all our speakers and moderators, whose presentations will showcase not only cutting-edge research but also the shared passion and connection we all maintain with our homeland.

The program features sessions in Aerospace, Medicine, STEAM (Science, Technology, Engineering, Arts, and Mathematics), and the Humanities, offering a broad view of the transformative power of research in addressing today's most pressing challenges, from technological innovation to sustainability, equity, and the common good.

Thank you for being part of this vibrant community.

A handwritten signature in blue ink, which appears to read 'Andrea Giuffrida'.

Andrea Giuffrida, PhD, MBA



*Senato della Repubblica
Il Presidente*

XIX CONFERENZA DEI RICERCATORI ITALIANI NEL MONDO

Bruxelles, 23 maggio 2025

Messaggio del Presidente del Senato

Saluto con vero piacere l'apertura della XIX Conferenza dei ricercatori italiani nel mondo.

Un appuntamento di alto valore scientifico e accademico, a cui anche quest'anno sono stato lieto di conferire il Patrocinio del Senato della Repubblica e per il quale desidero complimentarmi con la Comunità scientifica italiana del Texas, l'Università Librè di Bruxelles e tutti coloro che si sono dedicati con impegno e passione alla sua organizzazione.

Ho particolarmente apprezzato la decisione di ospitare i lavori congressuali di quest'anno nella sede del Parlamento Europeo. Una location che, oltre a sottolineare il prestigio e l'importanza della manifestazione, richiama l'attenzione delle Istituzioni nazionali ed europee sull'alto valore strategico della ricerca scientifica quale fondamentale motore di sviluppo sociale ed economico.

Sono sempre di più gli scienziati, i ricercatori e gli studiosi italiani che, ovunque nel mondo, continuano a essere protagonisti di progetti innovativi ed ambiziosi, raggiungendo eccezionali conquiste in ogni ambito del sapere e dell'innovazione: una ricchezza di talenti ed eccellenze che rende onore all'Italia e che dall'Italia deve essere premiata, sostenuta e valorizzata.



Senato della Repubblica
Il Presidente

In tale prospettiva, il recente piano di investimenti nella ricerca per 50 milioni di euro, varato dal Governo lo scorso 7 aprile, ritengo rappresenti un segnale forte e concreto che auspico possa contribuire ad alimentare nuove e durature collaborazioni tra i ricercatori italiani all'estero e il sistema scientifico nazionale, creando sinergie e ulteriori opportunit  di crescita e di sviluppo.

Rinnovo pertanto il mio saluto e i miei auguri di buon lavoro, nella certezza che le riflessioni di questa giornata sapranno essere prezioso crocevia di idee, progetti e iniziative per guidarci verso un virtuoso orizzonte di progresso, crescita e sviluppo a cui non far  mai mancare la mia convinta adesione.



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Segreteria del Presidente
PARTENZA 22 Maggio 2025
Prot: 2025/0000993/PRES

Il Presidente della Camera dei Deputati

Dr. Andrea Giuffrida
Presidente
Texas Scientific Italian Community

Messaggio

Desidero rivolgere il mio saluto più cordiale a tutti i partecipanti alla XIX Conferenza dei Ricercatori Italiani nel Mondo, organizzata dalla *Texas Scientific Italian Community* e dall'*Université Libre de Bruxelles*.

L'evento odierno ha il pregio di valorizzare il contributo offerto dai ricercatori italiani, attivi nel campo della scienza, della tecnologia e delle discipline umanistiche, alla crescita delle comunità che li hanno accolti. Nella società della conoscenza, infatti, la ricerca rappresenta un autentico pilastro del progresso civile, sociale ed economico di una Nazione.

La vostra attività all'estero rappresenta uno stimolo prezioso allo scambio di saperi e alla collaborazione internazionale, favorendo lo sviluppo di progetti innovativi e la diffusione di nuove idee.

Sono lieto, dunque, di unirmi idealmente a Voi per esprimere nei confronti dei presenti il mio più vivo apprezzamento per il costante impegno volto a promuovere il ruolo delle nostre comunità nel mondo.

Il vostro esempio dimostra come la parola "*merito*" possa e debba assumere un significato concreto, oltre a costituire motivo di grande orgoglio per l'intero Paese. Anche grazie alla dedizione e ai sacrifici dei nostri connazionali, ambasciatori di una ricca cultura fatta di ingegno, creatività e passione, l'Italia è ammirata a livello globale.

Certo che da questa giornata di lavori emergeranno interessanti spunti di riflessione, Vi giunga, quindi, il mio sentito augurio per il pieno successo dei lavori e per una proficua continuazione del vostro impegno.

Lorenzo Fontana



*Il Ministro degli Affari Esteri
e della Cooperazione Internazionale*

**MESSAGGIO DI SALUTO DEL VICE PRESIDENTE DEL CONSIGLIO E MINISTRO
DEGLI AFFARI ESTERI E DELLA COOPERAZIONE INTERNAZIONALE, ON.
ANTONIO TAJANI, IN OCCASIONE DELLA XIX CONFERENZA DEI RICERCATORI
ITALIANI NEL MONDO**

(Bruxelles, 23 maggio 2025)

Mi unisco molto calorosamente a tutti i partecipanti a questa nuova edizione della Conferenza dei Ricercatori italiani nel Mondo. Un'occasione per valorizzare il lavoro dei nostri talenti all'estero e per fare squadra attorno all'obiettivo del progresso scientifico e della crescita.

Sono per questo molto grato agli organizzatori di questo appuntamento, anche per la scelta di tenerlo presso il Parlamento Europeo. Da Presidente, ho voluto ospitarvi una grande conferenza sull'importanza della ricerca e dell'innovazione nella nostra vita di ogni giorno.

Per il Governo e per me personalmente il vostro lavoro è fondamentale!

Nei centri di ricerca più avanzati del mondo o nei Paesi emergenti, date grande lustro all'Italia e alla qualità del nostro sistema accademico e della ricerca.

Un'eccellenza che ha una ricaduta immediata nella capacità dei nostri territori di attrarre investimenti dall'estero da parte delle imprese più innovative, per esempio nel settore farmaceutico dove siamo tra i primi esportatori mondiali.

Penso anche ai molti supercomputer che fanno del nostro Paese il primo in Europa per potenza di calcolo installata e il terzo al mondo e che sono un cruciale motore di innovazione.

Tutto questo si traduce in eccezionali risultati per le nostre imprese, che sono ad esempio in prima linea nella corsa allo spazio. Penso alla tecnologia italiana a bordo della sonda lunare Blue Ghost, o alla collaborazione italiana con la NASA nel programma Artemis.

L'azione del Governo a favore dell'internazionalizzazione della ricerca e dell'innovazione punta a mettere l'Italia al centro dei flussi della ricerca mondiale, grazie alla presenza di prestigiose organizzazioni scientifiche



internazionali e attraendo nel nostro Paese grandi infrastrutture di ricerca internazionale. Su tutte penso all'*Einstein Telescope*, che vogliamo ospitare in Sardegna e con il quale gli scienziati potranno studiare lo spazio più profondo analizzando le onde gravitazionali.

Mettendo a sistema le capacità più avanzate nel campo della scienza e tecnologia, il nostro Paese dimostra di saper giocare un ruolo da protagonista anche in questi ambiti cruciali. L'obiettivo è mettere la scienza e la tecnologia al servizio della persona, della crescita, dell'occupazione e dello sviluppo.

Questo anche grazie al ruolo delle nostre Ambasciate nella promozione delle eccellenze italiane della ricerca ed a quello dei nostri Addetti Scientifici, che lavorano per una diplomazia scientifica come strumento prezioso di pace e crescita.

Il lavoro di squadra è la chiave del nostro successo e la Conferenza dei Ricercatori Italiani nel Mondo contribuisce a promuovere l'immagine di un'Italia all'avanguardia, capace di distinguersi anche alla frontiera del progresso scientifico e tecnologico, dalla fisica alla biologia fino alla ricerca in ambito spaziale.

Contate su di me, contate sul Governo! Buon lavoro a tutti!

Antonio Tajani



*Il Ministro
dell'Università e della Ricerca*

XIX Edizione della Conferenza dei Ricercatori Italiani nel Mondo

Bruxelles - 23 maggio 2025

Messaggio del Ministro Anna Maria Bernini

Rivolgo un caloroso saluto a tutti i partecipanti alla XIX edizione della Conferenza dei Ricercatori Italiani nel Mondo, che quest'anno si tiene in una sede di grande rilevanza istituzionale: il Parlamento europeo di Bruxelles.

Sono lieta che questa iniziativa, promossa dalla Texas Scientific Italian Community in collaborazione con l'Université de Bruxelles, stia crescendo, puntando a diventare un punto di riferimento per la comunità scientifica italiana all'estero.

La conferenza di quest'anno si distingue per l'apertura verso diversi ambiti di ricerca – dalla scienza e tecnologia all'aerospazio, dalla medicina alle scienze umane – e per la sua vocazione sempre più internazionale. L'incontro e lo scambio tra ricercatori e ricercatrici di diverse discipline e Paesi sono elementi fondamentali per affrontare le grandi sfide globali del nostro tempo, e rappresentano un modello di collaborazione virtuosa.

In questo contesto, l'Italia è fiera di poter contare su una comunità scientifica all'estero vivace, appassionata e fortemente impegnata nel contribuire all'avanzamento della conoscenza, allo sviluppo tecnologico e alla costruzione di ponti tra sistemi di ricerca nazionali. Il vostro lavoro è una risorsa preziosa non solo per il nostro Paese, ma anche per l'Europa e per la diplomazia scientifica, che oggi più che mai svolge un ruolo cruciale per il dialogo tra culture e la cooperazione tra nazioni ma anche come “driver” per la crescita economica.

Bruxelles, cuore pulsante delle istituzioni europee, rappresenta anche un luogo simbolico per riaffermare l'importanza del coordinamento tra politiche di ricerca e



*Il Ministro
dell'Università e della Ricerca*

innovazione a livello continentale. La partecipazione italiana a reti e progetti europei – dal Programma Horizon Europe alle infrastrutture condivise – testimonia il valore della cooperazione e la qualità dei nostri ricercatori.

Desidero quindi ringraziarvi per l'impegno con cui portate avanti le vostre attività, per il legame che continuate a mantenere con il nostro Paese e per il contributo concreto che offrite al prestigio scientifico e culturale dell'Italia nel mondo.

Un ringraziamento va infine agli organizzatori e ai sostenitori della conferenza, con l'augurio che anche questa edizione sia ricca di stimoli, confronti e nuove opportunità di collaborazione.

Buon lavoro a tutte e a tutti.



Il Ministro delle Imprese e del Made in Italy

***“Ricercatori italiani nel mondo”
Messaggio di saluto – 23 maggio 2025***

Rivolgo un saluto di stima e vicinanza ai ricercatori italiani nel mondo, espressione di un'Italia scientifica, dinamica e innovativa.

In un'epoca in cui tecnologia e conoscenza evolvono in modo rapidissimo e spesso imprevedibile, è essenziale promuovere programmi che favoriscano scambi e collaborazioni anche a livello internazionale: la ricerca è libera e non può conoscere confini.

La condivisione delle idee e delle esperienze accelera i progressi in tutti i settori, dal digitale alla medicina, dall'energia sostenibile all'agricoltura innovativa. Solo lavorando insieme possiamo affrontare le sfide globali che ci attendono contemperando le esigenze del progresso con quelle della sostenibilità.

L'emorragia di talenti che ha caratterizzato gli ultimi anni, con migrazioni importanti al di fuori del nostro Paese, ma anche da Sud a Nord all'interno dei nostri confini, è un fenomeno che ha radici



Grazie per la vostra dedizione e il vostro rigore, cuore pulsante di una
comunit  scientifica riconosciuta in ogni settore a livello
internazionale dove il genio “made in Italy” continua a fare la
differenza.

Adolfo Urso



Saluto istituzionale del Sottosegretario agli Esteri e Cooperazione Internazionale, Maria Tripodi in occasione della “XIX Conference of Italian Researchers in the World”

Bruxelles, 23 maggio 2025

È con grande piacere che porto il saluto del Ministero degli Affari Esteri e della Cooperazione Internazionale a questa prestigiosa conferenza, che celebra l'eccellenza della nostra comunità scientifica all'estero e testimonia il ruolo cruciale che l'Italia continua a svolgere nei grandi scenari internazionali della ricerca e dell'innovazione.

Da sempre, i nostri ricercatori sono protagonisti non solo nella produzione scientifica di altissimo livello, ma anche nella gestione e nel coordinamento delle più importanti infrastrutture e programmi di ricerca globale, dal CERN all'Agenzia Spaziale Europea, dalle missioni internazionali alle grandi collaborazioni nel campo delle scienze della vita e dell'energia. Un impegno che dimostra come la ricerca italiana sia un potente volano per la creazione d'impresa, l'innovazione tecnologica e la crescita economica, perfettamente in linea con la “diplomazia della crescita” fortemente sostenuta dal Ministro Antonio Tajani.

Proprio il Ministro Tajani ha recentemente ricordato che *“la diplomazia scientifica non è solo un ponte tra i popoli, ma un pilastro strategico per la competitività dell'Italia e per il rafforzamento delle nostre relazioni internazionali nei settori più innovativi”*.

La Presidente del Consiglio, Giorgia Meloni, nel corso della sua visita al CERN, ha sottolineato che *“investire nella ricerca scientifica significa investire nel futuro delle nuove generazioni e nella capacità dell'Italia di essere protagonista delle grandi sfide globali”*. Questo spirito si riflette nell'impegno del nostro Paese per attrarre e trattenere talenti, promuovendo politiche concrete per il rientro dei cervelli e per rendere l'Italia un polo di eccellenza capace di attrarre ricercatori stranieri.

In questa direzione si collocano i significativi investimenti previsti dal PNRR, destinati al rafforzamento delle nostre infrastrutture di ricerca e alla creazione di condizioni più favorevoli per lo sviluppo di progetti ad alta valenza internazionale. Un esempio è il recente stanziamento di 7,5 milioni di euro, assegnato al CNR per il potenziamento delle infrastrutture in Antartide, che rafforza la presenza italiana in un'area strategica per la ricerca ambientale e climatica a livello globale.



Attraverso la piattaforma per la diplomazia scientifica *Innovitalia* e un'azione diplomatica sempre pi  mirata, continuiamo a sostenere con determinazione le reti scientifiche italiane nel mondo e a promuovere l'incontro tra ricerca, impresa e istituzioni.

Siamo convinti che la scienza e l'innovazione, sostenute da un chiaro indirizzo politico, rappresentino il motore di un progresso che non conosce confini e che deve essere sempre pi  inclusivo e sostenibile.

A tutti voi, che con competenza, passione e spirito di servizio contribuite a tenere alto il nome dell'Italia nei pi  prestigiosi contesti internazionali, va il nostro pi  sentito ringraziamento e l'augurio di un confronto ricco di idee, stimoli e nuove opportunit .

Maria Tripodi

Sottosegretario di Stato

Ministero degli Affari Esteri e della Cooperazione Internazionale



19° conferenza dei “Ricercatori Italiani nel Mondo”, Bruxelles, il 23 Maggio, 2025

Messaggio di saluto del Presidente dell'Istituto Superiore di Sanità

E' con grande piacere che invio il mio saluto a tutti i partecipanti alla conferenza dei “Ricercatori Italiani nel Mondo”, arrivata quest'anno alla 19° edizione.

Desidero innanzitutto ringraziare la Texas Scientific Italian Community (TSIC) e il presidente Andrea Giuffrida, per l'impegno nell'organizzazione di questa importante manifestazione che si è consolidata nel corso degli anni.

Quest'anno la conferenza, organizzata in collaborazione con l'Universite' Libre de Bruxelles, si svolge presso la sede del Parlamento Europeo, sottolineando l'attenzione delle istituzioni europee per la ricerca in generale e per la comunità scientifica italiana nel mondo.

La ricerca è motore dello sviluppo economico, fattore centrale del progresso sociale e strumento antico e sempre attuale del dialogo fra i popoli.

La conferenza rappresenta un'importante occasione per i ricercatori italiani nel mondo e le loro associazioni per potenziare collaborazioni, contatti e condivisione di idee e progetti che servono a promuovere la cultura e la diplomazia scientifica. Ma la conferenza è anche un'opportunità per rafforzare i rapporti tra la comunità scientifica italiana nel mondo e le istituzioni e i gruppi di ricerca del nostro paese, favorendo importanti sinergie tra Italia e il resto del mondo.

L'Istituto Superiore di Sanità ha una consolidata storia di rapporti internazionali che lo vedono impegnato in collaborazioni con il Ministero degli Affari Esteri e della Cooperazione Internazionale e la sua Agenzia Italiana per la Cooperazione allo Sviluppo (AICS), così come con l'Unione Europea attraverso che progetti che includono singoli Stati o Aree regionali o reti di partner a livello europeo.

L'istituto è inoltre impegnato in collaborazioni tecnico-scientifiche con reti nazionali, europee e internazionali quali l'Organizzazione Internazionale Italo-Latino-Americano (IILA), e fora internazionali quali G7 e G20.

Uno dei principi a cui si ispira l'attività dell'Istituto Superiore di Sanità è che per garantire ricerca e innovazione di alta qualità sono necessari collaborazione, scambio e confronto continuo a livello globale. A testimonianza di questo, il 90% delle pubblicazioni scientifiche dell'Istituto Superiore di Sanità sono frutto di collaborazioni di cui quasi la metà sono internazionali.

Oltre alla ricerca, l'alta formazione è un importante ambito per favorire la mobilità di giovani ricercatrici e ricercatori non solo dall'Italia verso l'estero, ma anche dall'estero verso il nostro paese. In quest'ambito, l'impegno del nostro Istituto si realizza in più forme: borse di Dottorato di ricerca che prevedono programmi in collaborazione con Centri di ricerca in Africa; programmi di scambio, in corso di finalizzazione, con la Cina; finanziamenti su base



competitiva per giovani ricercatrici e ricercatori italiani o stranieri con meno di 33 anni che vogliano realizzare un progetto innovativo presso il nostro Istituto.

Auguro quindi buon lavoro ai partecipanti di questa conferenza e in generale alle ricercatrici e ai ricercatori italiani che operano nel mondo, confidando nel loro lavoro per una sempre maggiore internazionalizzazione della ricerca italiana e auspicando che il bilancio tra ricercatrici e ricercatori che escono ed entrano nel nostro Paese possa raggiungere nei prossimi anni un equilibrio meno penalizzante per il nostro Paese.

Prof. Rocco Bellantone



Antonio Cenini

COORDINATORE CONFERENZA PRESSO IL PARLAMENTO EUROPEO

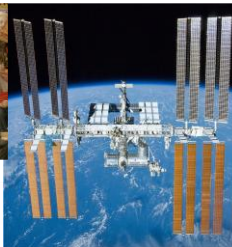
Buongiorno a tutti e benvenuti a Bruxelles per questa XIX conferenza dei ricercatori italiani nel mondo. È molto significativo che gli organizzatori, che ringrazio, e in particolare l'amico e collega nel Consiglio Generale degli Italiani all'Estero (CGIE), Vincenzo Arcobelli, abbiano scelto di tenere l'edizione di quest'anno a Bruxelles, al Parlamento Europeo, in una fase storica così cruciale per l'Europa in un contesto geopolitico estremamente complesso.

Inoltre, questo incontro si tiene mentre è in corso una riflessione molto approfondita sul tema della cittadinanza, su cosa significa "essere italiani", se debba considerarsi una questione prevalentemente formale o burocratica o piuttosto un elemento sostanziale basato su una cittadinanza attiva, caratterizzata da ciò che si fa concretamente per il nostro Paese. A tale riguardo, questa importante rete di ricercatori rappresenta un esempio eccellente di cosa significhi realmente essere italiani nel mondo, contribuendo alla crescita e al benessere dell'Italia da ogni parte del pianeta.

Le sfide geopolitiche che l'Europa si trova ad affrontare, oggi più che mai, di fronte a colossi come USA, Cina e India, si potrà vincere solo stando uniti e puntando sull'innovazione e la competitività dei nostri sistemi industriali e per questo è importante rafforzare la dimensione europea della ricerca e il vostro network di ricercatori italiani nel mondo può contribuire in modo straordinario a farlo.

Buona conferenza e buon lavoro!

Antonio Cenini



Program

XIX Conference of Italian Researchers in the World Brussels – May 23, 2025

11:00 – 12:45 (Local Time) –

Moderated by

Gabriele Andreoli

President of the Institute for
Advanced Studies and Cooperation
(IASCOP)

11:00 Welcome

Antonella Sberna

Vice President European Parliament

Anne Weyembergh

Vice Rector
Université libre de Bruxelles

Andrea Giuffrida

President Texas Scientific Italian
Community (TSIC)

Antonio Cenini

XIX Conference Coordinator at EU
Rep. General Council for Italians
Abroad - (CGIE)

Federica Favi

Ambassador
Embassy of Italy in Belgium

11:30 Opening Remarks

Vincenzo Arcobelli

Founder & Conference Chairman

Orazio Schillaci

Italian Minister of Health

**11:45 Associations of Italian
Researchers Abroad -
"Their Role"**

Cristina Bettin

President, Association of Italian
Scholars and Scientists in Israel (AISSI)

Ilaria Pagani

President, Association of Italian
Researchers in Australia (ARIA)

Rossana De Angelis

President, Rete dei Ricercatori Italiani
in Francia (RÉCIF)

Carla Molteni

President, Association of Italian
Scientists in the United Kingdom
(AISUK)

Fabio Pinna

President, AIRicerca Belgium

Rosanna Bonasia

President, Associazione Ricercatori
Italiani in Messico (ARIM)

12:45-13:00 Coffee Break

13:00 Sessions Presentation

AEROSPACE

Moderator

Stefano Boccaletti

Ph.D., Director of Research at the
Institute of Complex Systems of the
Italian CNR, Florence.
Member of the *Accademia Europea*
Fellow of the *American Physical*
Society
Editor in Chief of *Chaos Solitons and*
Fractals

Adriano Ghedina

Ph.D., Director of the Italian
"Telescopio Nazionale Galileo"
of the Institute National of
Astrophysics (INAF) SPAIN
"The Importance of the Contribution
of the Italian Telescopio Nazionale
Galileo to the Exo-Planetary
Research"

Cesare Grava

Ph.D., Lead Scientist, Southwest
Research Institute, NASA Solar System
Ambassador (2025), San Antonio,
Texas, USA.

"The UV spectrograph LAMP on
NASA's Lunar Reconnaissance
Orbiter: studying the Moon with
UltraViolet eyes"

Claudia Paladini

Ph.D., Associate Astronomer, Deputy
Head of the Office for Science at ESO
(European Southern Observatory),
Vice President of the European
Interferometry Initiative, Chile
"From Salento to the Andes: A story
of Giants – Stars and Telescopes"

13:45 Sessions Presentation

STEAM

Moderators

Timoteo Carletti

Ph.D., Namur Institute for Complex
Systems (naXys), Université de
Namur, Belgium

Simone Napolitano

Ph.D., Polymer and Soft Matter
Dynamics, Université libre de
Bruxelles, Belgium

Ludovico Minati

Ph.D., Director of the Interdisciplinary
Nonlinear Dynamics Laboratory
(INDLab), School of Life Science and
Technology, University of Electronic
Science and Technology of China,
Chengdu, China
"Across neurons and silicon: how
neuroscience and engineering can
inspire each other"



Program

XIX Conference of Italian Researchers in the World Brussels – May 23, 2025

Riccardo Muolo

Ph.D., Institute of Science Tokyo,
Japan

**"The Importance of Being Periodic:
the phase Reduction Approach to
Synchronization, from Kuramoto to
Deep Brain Stimulation"**

Itamar Procaccia

Ph.D., The Weizmann Institute of
Science, Rehovot, Israel

**"The unexpected consequences of
disorder in amorphous solids"**

Charo del Genio

Ph.D., Trakia University, Stara Zagora,
Bulgaria

**"The Multiple Scales of molecular
Recognition in Plants"**

Alessandro Parente

Ph.D., Aero-Thermo-Mechanics
Laboratory, Ecole Polytechnique,
Université libre de Bruxelles, Belgium

**"Decarbonizing Energy-Intensive
Industries with Data and Digital
Twins"**

David Cannella

Ph.D., Université libre de Bruxelles,
Belgium

**"When Light Meets Circular
Bioeconomy: The Next-Generation of
Greener Biofuels"**

Luca Fiorani

Ph.D., Senior researcher at ENEA,
Physical Technologies and Security
Division, Frascati

Seconded national expert in
disruptive technologies at the
European Commission, Directorate-
General for Defense Industry and
Space, Brussels, Belgium
**"Laser Photoacoustic Spectroscopy
for Fast and Contactless Sensing of
Nerve Gases"**

Elio Tuci

Ph.D., Université de Namur, Belgium
Faculty of Computer Science

"BABOTS : Biological Animal Robots"

Simone Lucatello

Ph.D., National Council of Science and
Technology (CONACYT) Mexico,
Coordinator Leader report GEO 7
United Nations Program (UN) and
Environment (UNEP)

**"Digital Transformation and Suitable
Development. The PRODIGEES
Project"**

Angelo Pinto

Ph.D., IEEE Fellow, Vice President of
External Manufacturing Production
(EMP) at Intel, San Diego, California,
USA

**"Navigating from Sicily to
Semiconductor Industry Leadership"**

15:30-15:45 Coffee Break

15:45

MEDICINE

Moderators

Andrea Giuffrida

Ph.D., Senior Vice President for
Research & Biotechnology
Western University of Health
Sciences, California, USA

Maddalena Parafati

Ph.D., Research Assistant Professor
Department of Pharmacodynamics
University of Florida, College of
Pharmacy

Antonio Colaprico

Ph.D., Translational Research
Department at Institut
Curie, PSL Research University, Paris,
France
**"Multi-Omics Profiling of
Neuroblastoma Identifies**

Immunological Biomarkers

**Associated with Higher Risk of
Relapse: Results from the MICCHADO
Study"**

Pietro Coletti

Ph.D., Université Catholique de
Louvain, Belgium

**"The Use of Social Contact Data to
Monitor Behavioral Changes During
the COVID-19 Pandemic"**

Enkelejda Miho

Ph.D., Digital Life Sciences Head of the
Laboratory of Artificial Intelligence for
Health Group Leader Swiss Institute of
Bioinformatics

**"Benchmarking Immunoinformatic
Tools for Sequence-Based Precision
Diagnostics of AL Amyloidosis"**

Eleonora Leucci

Ph.D., Laboratory for RNA Cancer
Biology, Department of Oncology,
Katholieke Universiteit Leuven,
Belgium

**"Exploiting the Dark Genome to
Overcome Cancer Therapy
Resistance"**

Viviana Vella

Ph.D., Department of Biochemistry
and Biomedicine, School of Life
Sciences, University of Sussex, UK

**"Unravelling New Modulators of
Therapy Resistance in Glioblastoma"**

Antonella Fioravanti

Ph.D., Université Libre de Bruxelles,
Faculté des Sciences, Belgium

**"The Microbial Age: Confronting
Pathogens, Protecting Health and
Facing Climate Change"**

Sara G.M. Piccirillo

Ph.D., The Robert M. Faxon Jr.
Endowed Professor in Neuro-
Oncology, The Brain Tumor
Translational Laboratory, University of
New Mexico Health Sciences Center



Program

XIX Conference of Italian Researchers in the World Brussels – May 23, 2025

Albuquerque, NM, USA

**"Single-Nucleus and Spatial
Landscape of the Sub-Ventricular
Zone in Human Glioblastoma"**

Casimiro Gerarduzzi

Ph.D., Department of Medicine,
University of Montreal, Canada

**"The Hidden Drivers of Kidney
Scarring - A New Look at Repair and
Inflammation"**

17:15

HUMANITIES

Moderator

Pasquale Nardone

Ph.D., Département de Physique
Laboratoire d'information quantique
Université libre de Bruxelles, Belgium

Michele Vincenti

Ph.D., Associate Dean Graduate
Programs, University Canada West
Vancouver, Canada

**"AI-Assisted Spirituality:
Transforming the Ignatian Exercises
and the Lectio Divina for Modern
Leadership Development"**

Eugenia Cenini

MS, Researcher Laboratorio de
Epigenetica- Departamento
Morfologia - CCS/UFES University of
Espírito Santo, Brazil
**"Mens Sana", Assessing Police
Military Officers Well-Being and
Quality of Life in the State of Espírito
Santo (BR), an Integrated Approach"**

17:40 Conclusion

Vincenzo Arcobelli

Founder & Conference Chairman



TEXAS
SCIENTIFIC
ITALIAN
COMMUNITY

ULB UNIVERSITÉ
LIBRE
DE BRUXELLES

MODERATOR



Gabriele Andreoli

President of the Institute for Advanced Studies and Cooperation (IASCOP)

Sir Prof. Dr. Gabriele Pao-Pei Andreoli MD, is a distinguished academic, a humanitarian leader, investor, philanthropist with a multidisciplinary and impactful career. He is a well-respected analyst, writer, diplomat and interdisciplinary researcher, with a background in law, medicine and multimedia.

As a strategic advisor, Prof. Andreoli is deeply involved in innovation and merging new technologies, focusing in AI and international diplomacy.

Currently, Sir. Andreoli is a liaison Representative of the Vatican, Pontifical Academy of Theology, professor of diplomacy and International Relations at the University of International Relations "Anania Shirakatsi", President of LiDU-AI (Lega Italiana Diritti dell'uomo) and of the "Institute for Advanced Studies and Cooperation," (IASC) an international humanitarian foundation promoting research and cooperation between governments, institutions, and universities. IASC foundation focuses on regenerative medicine and farming, flourishing ecosystems, the green economy, geopolitics, technological innovation, and security.

Sir Andreoli is the founder and director of the "World Changers Summit," www.wcsiascoop.org an international networking platform for scientific inclusion and development. The summit takes place at the prestigious Pontifical Academy of Sciences in Vatican City, during WEF at Davos and around the world uniting brilliant minds, agencies, universities, and governments for the betterment of society.

Prof. Andreoli is a member of the American Society of Diplomacy and Political Science, a researcher and honorary professor at the Catholic University, an academician of social sciences at IASS, Florida, USA, and an ambassador representative of the Red Cross of Northern Macedonia.

Appointed Knight of the Order of St. Gregory the Great in the Vatican City by Pope Francis in 2022. In 2023, he was named one of the most influential figures in the field of interdisciplinary scientific research by "The Monaco Voice," awarding him the "Monaco 40 over 40" in 2023, he received the "Capri Award" (Italy) as "Man of the Year" for his research blending ethics and faith in science with reference to artificial intelligence,



among the many recognitions for his Humanitarian and social work, In 2023, he received the "Dobrici" medal from the mayor of Wieliczka for his work on behalf of Ukrainian war refugees. For his contribution to scientific progress, he received the "Miner's Axe" (Barda górncza) Poland award in the same year. In 2024, he was awarded at the AIMS conference in Dubai for his work "Transcend R&D Project" on artificial intelligence and was named "Man of the Year" for his work in favor of the Albanian community. He was recognized as a valued member of international society in 2024 for his work in legality and anti-corruption by the Anti-Corruption Agency, in 2025 he received the "Mary Help of Christ Award" from the Roman Catholic Church of India. His latest book, presented in Davos 2025 "Transcend, Quantum AI and the future of humanity" focuses on ethical AI and the development of new interdisciplinary scenario and evolving consciousness. Prof. Sir Prof Dr. Gabriele Andreoli C.V. 2025 pg. 1 Andreoli is a TEDx speaker and has participated as a lecturer at major international events around the world. In Davos, Switzerland, in 2024, he presented the humanitarian project H.I.T. Malaria, which proposes treating malaria using H.I.T. Quantum dot technology. He received the "Future Innovation Summit Award" (Dubai) for two consecutive editions in 2022 for "cybersecurity" and in 2023 as a medical doctor researching anti-aging performance with the "Evolutionary Biohacking" protocol¹. This protocol is a philosophy and research method for cell regeneration and environmental enhancement.

Titles and Honors

Red Cross (Italy) silver cross medal, Red Cross (San Marino) silver cross medal, United Nations medal UNMIK Kosovo, E.U. Medal for the mission EUMM Georgia, Knight Grand Cross of the order of Prince Danilo I of Montenegro, Knight with honors of the Sacred Constantinian Order of St. Giorgio (Naples) Knight of the Saints Maurice and Lazzaro (Italy), Knight grand badge Royal Order of Civil Merit of Laos Commander of the Order of the Million Elephants and the White Parasol, Knight of Rizal (KR) Republic of Philippines, Golden Eagle Medal (Albania), Medal of Capistano Ordinamiento Militar de Venezuela, Knight of the order of St. Gregory the grate (Vatican State), Medal of "Dobrici" an Honorary Distinction of the Mayor of Wieliczka, Poland, the Miner's Axe (Barda górncza), given for the support of research and progress in science, Wieliczka, Poland, Knight Grand Cross of the order S. Michael of the wing (Portugal), Red Cross first class (Northern Macedonia) "Mary Help of Christ Award" (Roman Catholic Church of India)

Published books.

2024 Transcend, AI and the future of humanity.
 2023 "Evolutionary Biohacking the rising of A.I. in regenerative science"
 2022 "The Art of Lying" saggio Armando Curcio Editore
 2021 "Fantastic encounters" editore DRITËRO (Albania)
 2019 "Best winning mentality" Lupetti (Italia)
 2015 "Almost like a God" Golfera edizioni, (Italia)
 2012 "Multimedia evolution", Gangemi 2012 (Italia)

Main Studies

Anania Shirakatsi - Medicine faculty – antiaging therapies
 IBM cybersecurity Analyst
 Bocconi University, international leadership, and organizational Behavior
 Yale University, Moral Foundations of Politics
 University of London, Global Diplomacy – Diplomacy in the Modern World
 Leiden University, International humanitarian Law
 Catholic University of New Spain, Miami, "Human Letters"
 Miami University - Communication and Media Science
 Guglielmo Marconi University International Law



ASSOCIATIONS OF ITALIAN RESEARCHERS ABROAD “THEIR ROLE”



Cristina M. Bettin, PhD

President of Italian Scholars and Scientists in Israel (AISSI)

AISSI (Association in Israel) is a non-profit, non-political organization founded by academics and scientists of Italian origin. The association comprises approximately 140 members, including researchers, professors, and scholars from various scientific and humanities fields. AISSI collaborates actively with numerous institutions, including Israeli universities, the National Institute of Geophysics and Volcanology in Italy, the Italian Embassy, the Italian Cultural Institute in Tel Aviv, and the Israeli Embassy in Rome.

The association pursues several goals, including networking—connecting AISSI researchers both in Israel and Italy. This fosters new opportunities for collaboration between Italian and Israeli scholars, professors, and researchers. Our primary objective is to promote research and innovation across all sectors: scientific, technological, and humanistic, with a particular focus on Italian history, language, and culture. This mission is carried out not only within Israeli institutions but also with Italian institutions, including Italian businesses operating in both Israel and Italy.

AISSI aims to serve as a bridge between the Israeli academic community and Italian scientific institutions—not only universities but also research organizations such as the National Research Council (CNR). Despite the challenging times in Israel, we have managed to establish a strong and lasting network with Italian colleagues from various universities. This has led to new collaborations and research projects, both between individual researchers and between Italian and Israeli universities, resulting in new Erasmus programs and bilateral agreements.

One of the association's main objectives is to promote and support young Italian researchers in Israel, through the creation of a mentoring network that facilitates their integration into the academic world. AISSI also supports Israeli researchers who wish to work and conduct research in Italy, fostering the creation of joint projects between academic institutions in both countries.



One of our key initiatives is "La Pagina della Memoria" (The Memory Page), a platform that documents the impact of racial laws on Italian science and culture. This project is developed in collaboration with institutions such as the CNR and the Accademia dei Lincei.

Due to the situation that has halted international conferences, workshops, and visits from Italian colleagues, the association has continued to fulfill its mission through monthly webinars. These events, held in both Italian and English, cover topics of great interest, such as the environment, public health, and scientific research, providing opportunities for exchange and visibility for our members.

Some of the key webinars organized include:

- **Israeli Startups and Academia:** This webinar provided an in-depth look at Israel's startup ecosystem, a global leader in innovation and research. It shared strategies for launching startups while addressing the challenges and opportunities faced by researchers and innovators.
- **The Intersection of Physical Sciences and Communication:** This session explored how humor can enhance the understanding of complex concepts, such as quantum physics, offering fresh perspectives on scientific communication.
- **Artificial Intelligence: An Israeli Legal Perspective:** This discussion delved into the legal and regulatory implications of artificial intelligence in Israel, a rapidly evolving issue with global significance.

All webinars are recorded and made available online, accessible through our website and YouTube channel, so members and other interested parties can review the content and further explore the topics discussed.

BIOGRAPHY

Docente Universitario alla Ben Gurion University of the Negev e responsabile di tutti gli Studi Italiani sin dal 1999. Promotrice e coordinatrice di attività di ricerche scientifiche e culturali tra la Ben Gurion University of the Negev e l'Ambasciata Italiana di Tel Aviv. Co-fondatrice e Presidente della Aissi sin dalla sua nascita.

Storica specializzata in Storia ebraica moderna e contemporanea.

Autrice di diversi articoli scientifici sulla storia ebraica italiana, rappresentazione degli ebrei nella cultura e nella letteratura italiana, identità ebraica ed italiana, i soldati ebrei palestinesi e la Brigata Ebraica in Italia e di libri come *Italian Jews from Emancipation to the Racial Laws* (2010) e *the Tubiba of Tangier- The Life and Legacy of Lucia Servadio Bedarida* (2023). Attuali ricerche in corso e pubblicazioni riguardano i rapporti politici, diplomatici, militari e scientifici tra Italia ed Israele dal 1948 ai giorni nostri.



Ilaria Pagani

President, Association of Italian Researchers in Australasia (ARIA)

The Association of Italian Researchers in Australasia (ARIA): A Model for Bilateral Scientific Collaboration and Cultural Diplomacy

The Association of Italian Researchers in Australasia (ARIA) is a registered not-for-profit organisation dedicated to promoting collaboration among Italian researchers living and working across Australasia. Originally established in 2004 at the request of the Italian government, ARIA was primarily active in South Australia until its revitalisation in 2021 under the leadership of Dr Ilaria Pagani (President) and Dr Tiziana Torresi (Former Vice-President). Since then, ARIA has expanded its reach to encompass researchers throughout Australia, New Zealand, and the Pacific Islands. The association now includes a network of state-based representatives, such as Professor Chiara Palmieri and Dr Dalila Iannotta (Queensland and Northern Territory), Dr Simone Battiston (Victoria), Dr Antonio Esposito (New South Wales), and Professor Annette Condello and Dr Mauro Vaccarezza (Western Australia).

ARIA's mission is to build a robust, inclusive network of Italian researchers across all disciplines, strengthen engagement with both Italian and Australasian institutions, and promote scientific collaboration to support innovation, international mobility, and bilateral cooperation.

ARIA has launched several strategic initiatives. ARIA-Women promotes gender equity by empowering Italo-Australian women in academia and research. Through initiatives such as the ARIA nuova podcast on Radio Italiana 531 and curated social media content, ARIA-Women enhances the visibility of female researchers. In 2023, ARIA organised the event Women in Mentoring, attracting over 100 participants, including the Hon. Susan Close, Deputy Premier of South Australia. Participants described the event as rare and much needed, highlighting an unmet demand for structured mentorship and recognition in the research sector.

In parallel, ARIA-Young supports early-career researchers and students aspiring to pursue research careers. In partnership with Com.It.Es SA, ARIA developed the first dedicated guide for newly arrived Italian researchers in South Australia, outlining pathways to study and conduct research locally.

ARIA's activities have strengthened Italo-Australian research ties and contributed to international cultural diplomacy. This is exemplified by the interdisciplinary book *Italy and Australia: Redefining Bilateral Relations for the Twenty-First Century* (Palgrave Macmillan, 2023), edited by Dr Gabriele Abbondanza and Dr Simone Battiston. Thanks to the



network facilitated by ARIA, several members contributed to the volume, that was presented at the Italian Senate, underscoring the strategic importance of the volume and highlighting ARIA's pivotal role in shaping global research dialogues.

ARIA demonstrates the vital role of researcher networks in fostering scientific excellence, inclusivity, and bilateral cooperation. Its model could serve as a blueprint for other diaspora-driven scientific communities.

BIOGRAPHY

Dr Ilaria Pagani is a Group Leader at the South Australian Health and Medical Research Institute (SAHMRI) and an Affiliate Senior Lecturer at the University of Adelaide, Australia. She leads an internationally recognised translational research program focused on transforming the clinical management of Chronic Myeloid Leukaemia (CML). Her pioneering work aims to ensure that CML patients not only survive, but live well—targeting treatment-free remission, reduced toxicity, and improved quality of life. Her research integrates advanced molecular biology, genomics, and preclinical models to tackle drug resistance, disease persistence, and relapse prediction. Dr Pagani's findings have shaped clinical practice guidelines and continue to drive precision medicine in blood cancers.

She developed a highly sensitive blood test that measures residual leukaemia in CML patients to accurately predict relapse risk after stopping tyrosine kinase inhibitor therapy. The test detects BCR::ABL1, the genetic driver of CML, with high sensitivity and applies lineage tracing to determine which blood cells still harbour the disease. This is the first predictive tool for treatment-free remission (TFR) and is now being validated in the Australian TFR Registry, where Dr Pagani leads biomarker discovery efforts. The predictive model incorporates machine learning to analyse complex molecular and cellular data, improving relapse risk assessment and supporting personalised treatment decisions.

As founder of SAHMRI's CML Metabolism Program, Dr Pagani uncovered novel metabolic dependencies in resistant leukaemic stem cells, offering new therapeutic targets. Her research has earned multiple accolades, including top clinical abstract awards at the European School of Hematology (ESH) CML John Goldman Conferences (2022, 2024) and leadership roles at international leukemia meetings.

Beyond the laboratory, Dr Pagani is a passionate science communicator and advocate for community engagement. She is President of the Association of Italian Researchers in Australasia (ARIA), a registered not-for-profit organisation fostering scientific collaboration, cultural diplomacy, and gender equity. Under her leadership, ARIA has expanded its reach and launched initiatives supporting women and early-career researchers. She is also co-founder and co-chair of CML Australia, the nation's first charity dedicated to CML patient support and awareness.

Her commitment to science communication and outreach has been recognised by nominations for the South Australian Volunteer Awards (2024), SAHMRI Community Engagement Award (2022), and the Italian Research and Innovation Award in South Australia (2022). Dr Pagani actively mentors the next generation of scientists, fostering passion, resilience, and research excellence.



Rossana De Angelis

President, Rete dei Ricercatori Italiani in Francia (RÉCIF)

RÉCIF é un'associazione a fini non lucrativi, ai sensi della legge francese del 1901, e a carattere volontario.

Scopi dell'associazione:

Réseau des Chercheurs Italiens en France (RÉCIF) è una rete di persone, idee e progetti, creata con lo scopo di riunire i ricercatori e i professionisti italiani operanti in Francia nei campi della Ricerca, dell'Impresa e della Cultura.

RéCIF promuove:

- La valorizzazione del ruolo del ricercatore italiano all'estero, figura professionale inserita in un tessuto sociale ed economico ben definito.
- La creazione di una rete di ricercatori e professionisti italiani operanti in Francia e nel mondo, volto alla conoscenza, al confronto e alla collaborazione reciproci.
- Lo sviluppo di una rete tra associazioni di categoria ed enti pubblici e privati, operanti in Francia e nel mondo nei campi della Ricerca, dell'Impresa e della Cultura.
- L'assistenza all'integrazione dei giovani ricercatori italiani in Francia, fornendo informazioni sulle modalità di supporto alla ricerca, e sul reperimento di stage ed attività presso enti pubblici e privati.
- L'organizzazione di eventi di discussione, confronto ed indirizzo su tematiche inerenti i mondi della Ricerca, dell'Impresa e della Cultura.



Carla Molteni

President, Association of Italian Scientists in the United Kingdom (AISUK)

The Association of Italian Scientists in the UK (AISUK) was founded in 2015. It has over 700 members who operate in the research areas of Physical Sciences and Engineering, Life Sciences and Social Sciences and Humanities.

The goals of AISUK are: to bring together Italian scientists in the UK and facilitate networking; to promote scientific collaborations between Italian and British institutions and research centres; to increase the awareness in Italy and abroad of the work by Italian researchers in the UK and promote the mobility of researchers between Italy and the UK; and to provide mentoring and support for early career researchers.

Besides a board of directors, AISUK has a network of local representatives to promote activities at the local level.

AISUK works in synergy with other organizations and with the scientific office of the Italian Embassy in London. AISUK is part of the EU-funded platform CONNECTS, aimed at fostering scientific collaborations between the EU and the UK through the community of EU researchers operating in the UK.

AISUK activities include networking events for early career scientists (apericerca), seminars for the general public, informative events to support UK-Italy mobility, meetings with institutional figures of the Italian scientific landscape, outreach events in Italian for children in collaboration with Native Scientists.

BIOGRAPHY

Carla Molteni is the President of AISUK, the Association of Italian Scientists in the UK. She is Professor of Physics at King's College London and co-director of the Thomas Young Centre the Theory and Simulation of Materials. Her expertise is in computational modelling of materials and biological systems. She holds a PhD from the University of Milan, and, before joining King's, worked at the Max-Planck Institut fuer Festkoerperforschung in Stuttgart and at the Cavendish Laboratory in Cambridge.



Fabio Pinna

AIRIcerca Belgium President

AIRIcerca is an international association dedicated to connecting Italian researchers globally, across all fields of study. Its primary goal is to establish a robust networking platform that fosters collaboration and facilitates the exchange of valuable information regarding professional landscapes across different nations.

AIRIcerca pursues several key objectives. Firstly, it focuses on **scientific dissemination**, aiming to enhance the interaction between researchers and Italian society while elevating the public perception of research. Secondly, it actively promotes **scientific collaborations** at all levels among researchers by encouraging the exchange of ideas.

Thirdly, **networking among researchers** is central to its mission, with the goal of building a worldwide international community of Italian scholars. Finally, the AIRIcerca portal serves as a resource for **job opportunities**, publishing listings for positions, theses, doctoral programs, and internships both in Italy and internationally.

Participation in AIRIcerca is facilitated through various channels. Researchers can join active discussions and connect with peers by subscribing to the association's groups on Facebook and LinkedIn.

The AIRIcerca Belgium Chapter specifically focuses on Italian researchers who live, have lived, or are planning to move to Belgium. Its main aims are to build a local network among these researchers, stimulate collaborations both within the chapter and with external entities (industrial, academic, institutional) in Belgium and Italy, support the integration of members in Belgium, and promote the work of its members. These objectives are achieved through organized events that provide opportunities for members to meet and discuss their work, as well as through social media groups that facilitate ongoing online exchange on integration into Belgium and other topics of interest. Active participation in the chapter's social media pages or events is sufficient for membership. The Belgium Chapter strongly encourages its members to also register with the overarching international AIRIcerca association to access additional services.

In essence, AIRIcerca, with its local chapters like the one in Belgium, serves as a vital hub for Italian researchers worldwide, fostering connections, collaborations, and the sharing of knowledge and opportunities, ultimately strengthening the Italian research community on a global scale.

BIOGRAPHY

Fabio Pinna is a seasoned professional in innovation management, aerospace engineering, and project leadership, currently serving as Head of Innovation & Technology Governance at Telespazio Belgium. His role involves shaping the company's innovation strategy, managing technology portfolios, and ensuring the profitability and alignment of innovation projects with corporate goals. Previously, he worked as a Technical Project Manager at Septentrio, overseeing complex hardware and software projects, and as a Senior Research Engineer at the Von Karman Institute for Fluid Dynamics, where he led scientific and industrial research in high-speed aerodynamics and developed the VESTA toolkit for boundary-layer stability analysis. He has contributed to NATO research groups as well as European



space and defense projects. He served as editor and Treasurer for IMACS and he has been involved in European grant evaluations. Fabio holds a PhD in Aerospace Technology from the University of Rome "La Sapienza" and the Von Karman Institute, and an Executive MBA from Solvay Brussels School.



Rosanna Bonasia

President, Associazione Ricercatori Italiani in Messico (ARIM)

Master's degree in Geological Sciences and PhD in Earth Sciences from the Università degli Studi di Bari.

Post-doctorate on tephra fallout hazard assessment at Vesuvio and Campi Flegrei, at the National Institute of Geophysics and Volcanology in Naples, Italy.

Post-doctorate on tephra fallout hazard assessment for explosive Mexican volcanoes, at the Geosciences Center of the UNAM, Querétaro, Mexico.

Volcanologist by training, specialized in Computational Fluid Dynamics and risk analysis related to natural and engineering phenomena, through the application of numerical models and statistical analysis.

Currently Professor in Civil Engineering and Sustainable Technologies at the Tecnológico de Monterrey, Campus State of Mexico, Mexico.

The main research lines currently developed are:

- Analysis and evaluation of flood risk in Mexico through the study of hydrodynamic properties in channels and dams by the application of Eulerian and Lagrangian numerical models (SPH);
- Numerical study of wave transport and calculation of energy potential on the coasts of Mexico;
- Numerical simulations using the SPH model of the tsunami impact on the coasts;
- Long-range hazard assessment of dispersion and deposit of volcanic ash, through numerical models.

DISTINCTIONS

President of the Association of Italian Researchers in Mexico (ARIM). March 2023.

Mexican National System of Researchers Level 2.

Award for Educational Excellence Cusco 2020 Edition.

Doctor Honoris Causa and Golden Order of Teaching awarded by the International Organization for Inclusion and Educational Quality (OIICE).

President of the Fluid Dynamics Division of the Mexican Physics Society. 2019 - 2021.

SCIENTIFIC PRODUCTION

More than 20 scientific articles in JCR journals and three book chapters.

Editor of Frontiers in Earth Sciences journal special issue: "Flood Susceptibility and Risk

Maps as a Crucial Tool to Face the Hydrological Extremes in Developing Countries: Technical and Governance Aspects Linked by a Participatory Approach".



SHRO: Over Twenty Years of Science, Solidarity and Breakthroughs

In a world where research funding often gets entangled in politics and bureaucracy, the **Sbarro Health Research Organization (SHRO)** continues to prove that science, when guided by vision and integrity, can change lives and even entire communities. Founded by **Professor Antonio Giordano**, a globally renowned molecular biologist, SHRO has spent the last two years pushing the frontiers of cancer research, with an approach that's anything but traditional. From pioneering virtual reality support for science research, to launching artificial intelligence tools in oncology labs, SHRO is redefining what it means to fight cancer in the 21st century.

A Global Mission with Local Roots

Headquartered at **Temple University** in Philadelphia, SHRO operates an international network of high-tech labs in the United States and Italy, specifically in **Philadelphia, Turin, Siena, Naples, and Mercogliano**. This unique structure allows SHRO to merge **American innovation** with **European scientific tradition**, creating a transatlantic hub for discovery.

Professor Giordano's leadership has been the catalyst. With over 600 scientific publications and 15 international patents, his legacy includes the discovery of **tumor suppressor gene Rb2/p130** and **cell cycle regulators CDK9 and CDK10**, which now influence treatment approaches for cancer and even HIV. His more recent studies have highlighted the use of **oleanolic acid in combination with chemotherapy** to enhance effectiveness and reduce side effects, a promising path in the age of personalized medicine.

But it's not only about molecules and mechanisms.

Humanizing Cancer Care

One of SHRO's most talked-about recent initiatives blends **technology and empathy**. In clinical settings, SHRO researchers are exploring the use of **augmented reality visors** to assist patients during chemotherapy. These VR-based interventions significantly lower anxiety and improve mood, with early evidence suggesting they may even improve treatment adherence and survival rates. It's a reminder that in cancer care, **human comfort is as vital as clinical data**.

At the same time, SHRO has ramped up its investments in **AI-driven research**. The newest lab, a 15,000-square-foot space in central Philadelphia, is dedicated to developing **machine learning models** that predict treatment outcomes and identify drug resistance patterns in **ovarian and gynecological cancers**. This shift marks a strategic move to harness computational power for faster, more accurate diagnostics.

Training the Future

With over **400 students from 40+ countries** having passed through SHRO's training programs, the organization has become a magnet for young talent. SHRO's **Young Mobility Program** offers scholarships and research fellowships



that allow emerging scientists to move between its labs in Italy and the U.S., learning techniques like CRISPR, single-cell sequencing, and AI-assisted microscopy.

In 2024 alone, SHRO funded **dozens of scholarships** and **international fellowships**, helping form a new generation of scientists equipped to tackle tomorrow's medical challenges.

Science with a Conscience

What makes SHRO truly unique is its **dual commitment to science and social justice**. In Southern Italy, particularly in the region known as the "**Terra dei Fuochi**" (**Land of Fires**), Professor Giordano and SHRO have been at the forefront of exposing the tragic links between **illegal toxic waste dumping by the mafia** and rising cancer rates.

These areas, heavily polluted and politically neglected, have seen a dramatic spike in tumors among children and adults. Through **epidemiological research**, legal advocacy, and public awareness campaigns, SHRO has amplified the voices of these invisible victims. Giordano himself has paid a personal price for this work, facing threats for speaking out, but he continues to lead these efforts with courage. In recognition of this, he received the **Golden Lion for Lifetime Achievement** in Venice and the **Journalistic Award "Mimmo Castellano"** for his investigative work on environmental crimes.

90% to Research

While many nonprofits spend large portions of their budgets on administration or marketing, SHRO is radically different: **90% of all donations go directly to scientific research and education**. Researchers themselves help manage the organization's operations, ensuring every dollar supports real progress. This model has helped SHRO maintain both **credibility and sustainability**, all while producing discoveries that have appeared in top journals like *Nature*, *Science*, and *The International Journal of Molecular Sciences*.

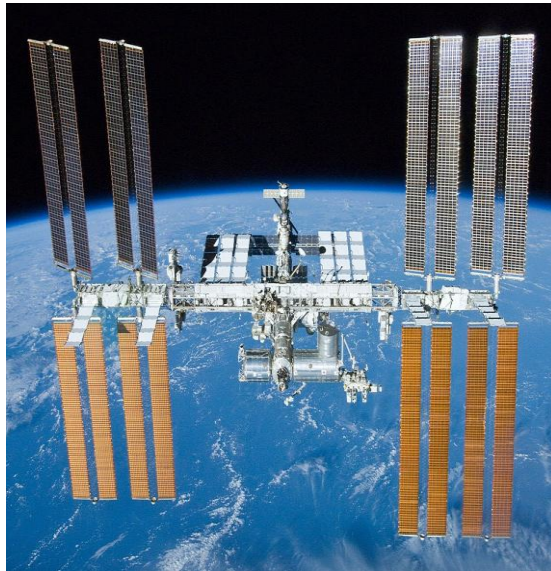
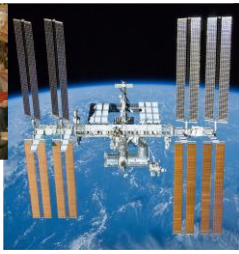
The Takeaway

SHRO isn't just a research institute, it's a **scientific movement**, one that blends innovation, integrity, and humanity. Under Professor Giordano's leadership, it has evolved into a bridge between continents, a platform for the next generation, and a watchdog for public health in forgotten places. For the American public, SHRO is a reminder that **science is not just about labs and data**, but about stories, people, and change. And as it continues to grow, SHRO is inviting all of us to be part of that change, because curing cancer isn't just a dream, it's a plan in action.

In his research throughout the years, Dr. Antonio Giordano identified a tumor suppressor gene, Rb2/p130, that has been found to be active in the lung, endometrial, brain, breast, liver, and ovarian cancers. Dr. Antonio Giordano also found that if doses of gamma radiation are combined with this gene, it accelerates the death of tumor cells. Dr. Antonio Giordano went on to discover Cyclin A, Cdk9, and Cdk10. Cdk9 is known to play critical roles in HIV transcriptions, the inception of tumors, and cell differentiation. They also play a part in muscle differentiation and have been linked to various genetic muscular disorders. Dr. Antonio Giordano has also developed patented technologies for diagnosing cancer.



BIOS AND ABSTRACTS



AEROSPACE



MODERATOR



Stefano Boccaletti

Ph.D., Director of Research at the Institute of Complex Systems of the Italian CNR, Florence
 Member of the *Accademia Europea* Fellow of the *American Physical Society*
 Editor in Chief of *Chaos Solitons and Fractals*

Stefano Boccaletti received the PhD in Physics at the University of Florence in 1995, and a PhD honoris causa at the University Rey Juan Carlos of Madrid in 2015. He was Scientific Attache' of the Italian Embassy in Israel during the years 2007-2011 and 2014-2018. He is currently Director of Research at the Institute of Complex Systems of the Italian CNR, in Florence. His major scientific interests are i) pattern formation and competition in extended media, ii) control and synchronization of chaos, and iii) the structure and dynamics of complex networks. He is Editor of the Journal "Physics Reports" (Elsevier) and, from 2013 to 2025, he has been Editor in Chief of the Journal "Chaos, Solitons and Fractals" (Elsevier). He is member of the Accademia Europaea since 2016, and Fellow of the American Physical Society from 2024. He was elected a member of the Florence City Council from 1995 to 1999.

Boccaletti has published 352 papers in peer-reviewed international Journals, which received more than 41,000 citations (Google Scholar). His h factor is 76 and his i-10 index is 241. With more than 13,500 citations, the monograph "Complex Networks: Structure and Dynamics", published by Boccaletti in Physics Reports in 2006 converted into the most quoted paper ever appeared in the Annals of that Journal.



THE IMPORTANCE OF THE CONTRIBUTION OF THE ITALIAN TELESCOPIO NAZIONALE GALILEO TO THE EXO-PLANETARY RESEARCH

Adriano Ghedina

Director of the Telescopio Nazionale Galileo – INAF - SPAIN



ABSTRACT

Since the discovery of the first planet around a star similar to our Sun, already 30 years ago, the quest for an earth like exo-planet, maybe hosting life, is still ongoing. Several international space telescopes both from NASA and ESA like Kepler, Gaia, Tess, Cheops and in the next years Plato and Ariel, are dedicated to scan the heaven waiting for glimpse of light that could reveal the presence of a planet orbiting other stars. More than 5000 thousands have been detected so far. From the Earth we have to follow-up these candidates and confirm, weight and characterize these infinite worlds. The Telescopio Nazionale Galileo (TNG) is an Italian astronomical facility of the INAF institute of astrophysics, sited in Canary Islands that since 2012 is actively contributing to the exo-planetary research.

In this presentation I will briefly outline how the TNG, thanks to its high performance instrumentation, specifically dedicated to the science of extra solar planets, allows to fully describe and study these new solar systems, to measure their masses and their atmospheres, to understand their past and formation history.

I will show how, at the TNG, Italian, Spanish and international researchers have access to the best research facility of the norther hemisphere and can maintain a leading role in exo-planetary research.

BIOGRAPHY

Adriano Ghedina is the Director of the Telescopio Nazionale Galileo - INAF since 2022. Born in Cortina d'Ampezzo (BL- Italy) in 1970, graduated in Astronomy at the University of Padua, specializing in optics and instrumentation, in particular the Adaptive Optics system of the TNG, with Prof. Barbieri and Ragazzoni. Since 1997 he has been working at the TNG, first as an optical engineer, support Astronomer and later Head of Operations, contributing to the maintenance, upgrade and development of the telescope and its instrumentation. During the nearly 30 years of experience at the TNG Ghedina had the opportunity to set up collaboration with researchers all over the world and to work side by side with Nobel Prizes as Prof. Michel Mayor and Prof. Didier Queloz (for exoplanetary research) and Prof. Anton Zeilinger (for quantum entanglement experiments). Ghedina has tens of participation to scientific conferences and nearly one hundred participations in refereed papers.



THE UV SPECTROGRAPH LAMP ON NASA'S LUNAR RECONNAISSANCE ORBITER: STUDYING THE MOON WITH ULTRAVIOLET EYES

Cesare Grava

Ph.D., Lead Scientist, Southwest Research Institute (SwRI), San Antonio, Texas



ABSTRACT

The Lunar Reconnaissance Orbiter (LRO) has been orbiting the Moon since 2009. As the name reveals, it was developed by NASA with the goal of mapping the lunar surface in preparation for the return to the Moon decades after the last Apollo mission.

Among its seven instruments is the Lyman-Alpha Mapping Project (LAMP), an imaging spectrograph sensitive to the ultraviolet light. It was developed by Southwest Research Institute in San Antonio, Texas, as part of the “UVS family” of instruments that have flown on multiple missions from NASA (New Horizons, Juno, Europa Clipper) and ESA (Rosetta, Juice).

LAMP main scientific goals are to characterize the mineralogy and hydration of the lunar surface and monitor key species in the tenuous lunar atmosphere (exosphere). When observing the lunar dayside, LAMP collects solar photons reflecting off the lunar surface, while when observing the lunar night side, it collects photons from the interplanetary medium and stars. This innovative technique makes it possible for LAMP to “see” inside the lunar Permanently Shaded Regions (PSRs). These are areas around the poles that never receive direct solar illumination and thus are thought to contain vast resources of volatiles that would enable the lunar robotic and crewed exploration.

I will review the main scientific results of LAMP, including (but not limited to): the detection of numerous volatiles both in the plume of the LCROSS impact (on the PSR of the Cabeus crater on the lunar South Pole) and in the lunar exosphere, the monitoring of the hydration on the lunar surface, and the discovery of geologically recent craters.

BIOGRAPHY

I am an astronomer studying planetary exospheres using a combination of modeling techniques and spectroscopic observations (both from the ground, in the visible and infrared, and from orbiting spacecraft, in the ultraviolet). I obtained my Laurea Magistrale (Master's degree) in Astronomy at the University of Padua (Italy) with a thesis on the Exosphere of Mercury. I obtained my PhD in Astronomy at the same University with a thesis on the exospheres of the Moon, Mercury, Io, and Lutetia.



During and after my PhD I carried out spectroscopic observations of all four Galilean satellites (Io, Europa, Ganymede, and Callisto) from several large telescopes, such as the Italian Telescopio Nazionale Galileo (TNG) in La Palma (Canary Islands, Spain) and the 3.5-meter telescope APO (Apache Point Observatory) in New Mexico, USA.

I am currently working on modeling of the exospheres of the Moon, Mercury, and the five largest Uranian moons, on calibration and data analysis of the LAMP UV spectrograph (of which I am Deputy Principal Investigator) on board of NASA's Lunar Reconnaissance Orbiter, and on data prediction for NASA's mass spectrometer Strofio that is currently en route to Mercury on board of ESA-JAXA BepiColombo mission.

Awards:

- NASA Group Achievement Award (2015): Lunar Reconnaissance Orbiter Extended Science Mission Team)
- NASA Solar System Ambassador (2025)

Membership:

American Astronomical Society (AAS), American Association for the Advancement of Science (AAAS), American Geophysical Union (AGU), and the Planetary Society.



FROM SALENTO TO THE ANDES: A STORY OF GIANTS – STARS AND TELESCOPES

Claudia Paladini

Ph.D., Associate Astronomer, Deputy Head Office for Science, European Southern Observatory (ESO), Chile



ABSTRACT

This presentation traces a journey from the region of Salento in Italy to the towering Andes mountains of Chile, where some of the world's most advanced astronomical observatories operate. It explores the fascinating parallels between the giants of the cosmos— stars in their final evolutionary phases—and the giant telescopes built by humans to observe them. By bridging personal heritage and cutting-edge science, I will highlight key discoveries in stellar evolution, the role of optical interferometry, and the collaborative efforts that push the boundaries of our understanding of the universe. This talk also offers insight into the vibrant scientific community behind these instruments and the broader impact of global research collaboration.

BIOGRAPHY

Dr. Claudia Paladini is an Associate Astronomer at the European Southern Observatory (ESO), based at the Paranal Observatory in Chile. She holds a PhD in Astronomy and Astrophysics from the University of Vienna, where her research focused on carbon-rich evolved stars using spectroscopy, interferometry, and model atmospheres. After postdoctoral work in Vienna and at the Université Libre de Bruxelles, she led ESO/VLT(I) large programs targeting evolved stars with instruments such as MIDI, VISIR, and Herschel/PACS.

Since joining ESO in 2017, she supports observations with the Very Large Telescope Interferometer (VLTI), particularly with the PIONIER and MATISSE instruments, advancing high-resolution imaging techniques. Her scientific interests include stellar evolution and atmospheric studies of evolved stars.

Dr. Paladini has published significant results in *Nature*, including breakthrough findings on the structure and dynamics of evolved stars, contributing to a deeper understanding of stellar evolution. She currently serves as President of the European Interferometry Initiative (EII), fostering collaboration and innovation within the optical interferometry community.

In addition to her scientific work, she is deeply committed to STEM engagement and science outreach.



STEAM



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MODERATOR

Timoteo Carletti

Ph.D. Namur Institute for Complex Systems (naXys), Université de Namur, Belgium

After a Masters degree in Physics (University of Florence, June 1995) Timoteo Carletti continued his doctoral studies in Florence (Italy) and in Paris (France) at IMCCE, and finally defended his doctoral thesis in mathematics in February 2000.

After several postdoctoral research stays - including Paris XI, IMPA (Rio de Janeiro, Brazil), "Scuola Normale Superiore" Pisa (Italy), University of Padova (Italy) - he was hired as a "senior researcher" in the framework of the European Project PACE FP6 (University of Venice, Italy).

Hence in 2005 he moved to Belgium where he was hired at the University of Namur as a lecturer, then as a professor (September 2008), and finally as a Full Professor (September 2011) in the Department of applied Mathematics. In 2010 he was among the creators of the Namur Center for Complex Systems, today Namur Institute for Complex Systems, and up to December 2014 he assumed the leadership of this research center. Since August 2021 he is Director of the Department of mathematics at the University of Namur.

He supervised several theses and master theses mainly in mathematics, but also in economics, biology and computer sciences. He actively contributes to the doctoral and postdoctoral training in the field of complex systems in Belgium, through its presidency of the Graduate School FNRS "COMPLEX" in the period January 2011 - December 2017. He presented more than one hundred seminars, and he is author of more than two hundred publications, in fields as varied as: biology, celestial mechanics, chaos detection, complex networks, control of systems, dynamic systems, economics, particle accelerators, social dynamics.



MODERATOR

Simone Napolitano

Ph.D., Polymer and Soft Matter Dynamics, Université libre de Bruxelles, Belgium

Simone Napolitano is an Italian-Belgian physicist born in 1981, specializing in polymer and soft matter dynamics. He earned his Master's degree in Materials Science from the Università di Pisa in 2005 and completed his Ph.D. in Polymer Physics at KU Leuven in 2007, within the framework of the EU-funded FP6 RTN Polyfilm – Marie Curie Actions. Following this, he held a postdoctoral fellowship from the Research Foundation – Flanders (FWO) from 2008 to 2011. Since 2011, he has been a faculty member at the Université libre de Bruxelles (ULB), where he founded the Laboratory of Polymer and Soft Matter Dynamics in 2013 and Experimental Soft Matter and Thermal Physics group in 2019. He's currently a professor of experimental soft matter physics and the academic trustee of the students with special needs of the faculty of science of ULB.

Professor Simone Napolitano is a leading experimental soft matter physicist at the Université libre de Bruxelles (ULB), where he heads the Laboratory of Polymer and Soft Matter Dynamics. He is renowned for his work on the molecular dynamics of polymers, particularly under nonequilibrium conditions and nanoscale confinement. A major focus of his research is the so-called slow Arrhenius process (SAP), a universal relaxation mechanism observed in a broad class of glass-forming systems. Contrary to the dominant view that relaxation in supercooled liquids must necessarily involve cooperative, non-Arrhenius dynamics, Napolitano's work has shown that many systems exhibit a slow, thermally activated behavior that follows simple laws and persists well below the glass transition temperature. This component is a key signature of intrinsic molecular motion within disordered matrices, reflecting small-scale rearrangements that are not captured by traditional models. His studies have demonstrated the presence and significance of SAP across diverse materials, and especially in systems out of equilibrium, such as aging materials, ultrathin polymer films, and adsorbed layers.

Beyond SAP, Napolitano's research encompasses the effects of irreversible polymer adsorption on nanoconfinement phenomena, demonstrating how such adsorption can modulate materials' properties and the kinetics of crystallization in thin organic layers, identifying the molecular origin of their confinement effects.

Through these studies, Napolitano's work provides a comprehensive understanding of how interfacial interactions, nonequilibrium phenomena and confinement influence the behavior of polymeric materials at the nanoscale.



ACROSS NEURONS AND SILICON: HOW NEUROSCIENCE AND ENGINEERING CAN INSPIRE EACH OTHER

Ludovico Minati

Ph.D., Director of the Interdisciplinary Nonlinear Dynamics Laboratory (INDLab), School of Life Science and Technology, University of Electric Science and Technology of China, Chengdu, China

ABSTRACT

What makes the brain unique, and what exactly is unique about it from a physical perspective, after all? I will try to approach these questions by first highlighting two aspects. One, the profound differences with respect to present-day computers. Two, how Nature has leveraged, to construct brains, some phenomena that are actually universal, pervasive in other systems, and thus possible to replicate electronically at some level. I will discuss how similar emergent behaviors can be observed across rather diverse systems, and how comparing brain activity to some rather unusual electronic circuits could be inspiring, both for neurophysiology and for electronic engineering. I will briefly overview my recent research attempting to “summarize” in simple electronic circuits, mainly so-called chaotic oscillators, some phenomena arising in other biological and physical scenarios, especially in brain dynamics. Firstly, a gallery of these rather unusual circuits will be walked through, surveying some oscillators based on transistors, gas-discharge tubes, and other electronic components. Secondly, simple networks of these circuits will be considered, demonstrating the spontaneous emergence of phenomena commonly observed in neural recordings, such as community structures, remote interdependences, and so on. Thirdly, some applications will be discussed, comprising the creation of physical instead of simulated in-silico disease models, bio-inspired pattern generation, and engineering applications such as in distributed sensing. While by no means a comprehensive introduction to this young multidisciplinary field, this presentation should hopefully provide some ideas regarding how engineering and neuroscience can provide mutually inspire each other.

BIOGRAPHY

Ludovico Minati received the Ph.D. degree in Neuroscience from the Brighton and Sussex Medical School, Falmer, U.K., in 2012, the D.Sc. (doktor habilitowany) degree in Physics from the Institute of Nuclear Physics, Polish Academy of Sciences, Kraków, Poland, in 2017, and the M.B.A. degree in Technology Management from The Open University, Milton Keynes, U.K., in 2021. Until 2023, he was a Specially Appointed Associate Professor with the Institute of Innovative Research, Tokyo Institute of Technology, Tokyo, an Affiliate Research Fellow with the Center for Mind/Brain Sciences, University of Trento, Trento, Italy, and a Freelance Research and Development Consultant. He is now a Professor, Overseas Outstanding Young Talent and Director of the Interdisciplinary Nonlinear Dynamics Laboratory at the School of Life Science and Technology, University of Electronic Science and Technology of China, Sichuan, China, and a Visiting Professor with the Center for Mind/Brain Sciences, University of Trento, Trento, Italy. He has authored more than 190 articles and several patents. His research interests include nonlinear dynamical systems, chaotic oscillators, reconfigurable analog and digital computing, analog integrated circuits, advanced techniques for biosignal analysis, brain-machine/computer interfaces, and robotics.



He is a Senior Member of the IEEE, a European Engineer (Eur. Ing.), a Chartered Engineer (CEng) and a member of the Institution of Engineering and Technology, U.K. He is also a member of the Institute of Electronics, Information, and Communication Engineers (IEICE), and the Institute of Electrical Engineers (IEE) of Japan.



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THE IMPORTANCE OF BEING PERIODIC: THE PHASE REDUCTION APPROACH TO SYNCHRONIZATION, FROM KURAMOTO TO DEEP BRAIN STIMULATION

Riccardo Muolo

Ph.D., Institute of Science Tokyo, Japan



ABSTRACT

Synchronization behavior is the process in which multiple oscillatory interacting systems begin to line up their rhythms and it is observed in many natural systems, e.g., the beating of a heart, or the flashing of fireflies. This also happens in artificial systems and was discovered by Dutch scientist Christiaan Huygens in the XVII century while working on pendulum clocks. A general model for studying such phenomenon was lacking until the great intuition of Yoshiki Kuramoto who, inspired by the works on biological oscillators of Arthur Winfree, was able to obtain its famous model through the theory of phase reduction. This was in 1975, exactly 50 years ago. In this talk I will present the main milestones in the study of synchronization dynamics and the basics notions of phase reduction theory. This powerful technique, applicable to any periodic system, allows to greatly simplify models of interacting oscillators and has many applications, from power grids to neuroscience.

BIOGRAPHY

Riccardo studied Physics (BSc) and Applied Mathematics (MSc) in Florence (Italy). After a year at VU Amsterdam (The Netherlands) in a group of Systems Biology, he joined the group of Applied Mathematics of Professor Teo Carletti at naXys, the Namur Institute for Complex Systems (Belgium). Over his PhD he had the opportunity to visit other institutions, such as MACSI (Ireland), Università di Catania (Italy) and the Mathematical Institute of UFRJ (Brazil). From October 2023 he is a Postdoc in the group of Professor Hiroya Nakao at the Institute of Science Tokyo (former Tokyo Tech). His research is mainly about synchronization and pattern formation on networks and higher-order structures, such as hypergraphs and simplicial complexes. His main focus is understanding how the underlying topology affects the global dynamics of the system.

Besides research, he is also interested in outreach, especially in schools, where he often carries out activities within the project Penne Amiche della Scienza.



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THE UNEXPECTED CONSEQUENCES OF DISORDER IN AMORPHOUS SOLIDS

Itamar Procaccia

Ph.D., The Weizmann Institute of Science, Rehovot, Israel



ABSTRACT

I will review our recent work in which we developed a screening theory for describing the effect of plastic events in amorphous solids on their emergent mechanics. The suggested theory uncovered an anomalous mechanical response of amorphous solids where plastic events collectively induce distributed dipoles that are analogous to dislocations in crystalline solids. Classical elasticity is unable to predict the observed phenomena, and a novel theory needs to be derived and solved. The theory was tested against various straining protocols of amorphous solids in two and three dimensions, including frictional and friction-less granular media and numerical models of amorphous glass. I will conclude by interpreting the mechanical response as the formation of non-topological distributed dipoles that have no analogue in the crystalline defects literature. Having in mind that the onset of dipole screening is reminiscent of Kosterlitz-Thouless and Hexatic transitions, the finding of dipole screening in three-dimensions is particularly novel.

BIOGRAPHY

Born in Tel Aviv, Prof. Procaccia earned a BSc in chemistry in 1973 and a PhD in theoretical chemistry in 1976 from the Hebrew University of Jerusalem. After conducting postdoctoral research at the Massachusetts Institute of Technology, he returned to Israel in 1979 and joined the Weizmann Institute. At the Weizmann Institute he served twice as the dean of the Faculty of Chemistry, from 1987 to 1988 and 1989 to 2001. He was the first head of the Braginsky Center for the Interface between Science and Humanities until 2019. Today, he is the incumbent of the Barbara and Morris L. Levinson Professorial Chair in Chemical Physics.

Prof. Procaccia constructs the theoretical concepts needed to tackle complex phenomena in nature, which tend to be disordered, chaotic, and full of strange shapes. Disorder can appear either in space (glasses, amorphous solids), in time (non-periodic behavior) or concurrently in both space and time (e.g. turbulence.) His specific interests include



nonequilibrium thermodynamics and statistical mechanics, instabilities, nonlinear systems, chaotic motions, turbulence, and the physics of friction and fracture.

Over the years, Prof. Procaccia has been the recipient of a long list of awards, including the Israel Prize in Physics in 2009. In 2017 alone, he earned three honors: the European Physical Society Prize for Statistical and Nonlinear Physics, a Simons Foundation Professional Fellowship by the Niels Bohr International Academy in Denmark, and membership in the Academia Europaea. Among his many other awards and honors have been the Rita Levi-Montalcini Prize from the Government of Italy in 2016, an American Physical Society Fellowship in 2002, and membership in the German Academy of Natural Sciences Leopoldina that same year. Prof. Procaccia was also named a member of the Royal Danish Academy of Science in 2010, and a fellow of the Institute of Physics in the United Kingdom in 2004. He received the Fiorino d'Oro—the highest prized given by the municipality of Florence, Italy, for outstanding achievements in science, culture, and human affairs—in 1998 and the prize for Life Achievements in Nonlinear Dynamics, given by the Polish Academy of Sciences, in Warsaw in 2002.

In 2007, Prof. Procaccia was knighted by the President of Italy, and was made a Grand Officer of the Order of the Star of Italian Solidarity. He is a three-time fellow of the Japan Society for the Promotion of—in 1987, 1992, and 1999—and was awarded the Gauss Professorship from the Academy of Science in Gottingen in 2011. In 2012, he was knighted once again as the Grand Cross of the Order of Scientific Merit of the Federal Government of Brazil and served as the Raymond and Beverly Sackler Distinguished Lecturer at the Niels Bohr International Academy in 2013. He was elected as a chair of the Commission for Statistical Physics of the International Union of Pure and Applied Physics (IUPAP) and received the AIRBUS professorship in recognition of contributions in the theory of turbulence in 2014. In 2015, he presented the S. Chandrasekhar Lectures in the IISc, Bangalore, India. In 2025 he was nominated as the Chair of the Section of Physics and Engineering of the Academiae Europaea.

Prof. Procaccia is an active collector of ancient Asian and tribal art. He has two sons—Ariel, a full professor of computer science at Harvard University, and Eviatar, an associate professor of mathematics at the Technion in Haifa—as well as six grandchildren.



THE MULTIPLE SCALES OF MOLECULAR RECOGNITION IN PLANTS

Charo del Genio

Ph.D., Trakia University, Stara Zagora, Bulgaria

ABSTRACT

Focusing mostly on the molecular recognition system of auxin, the plant growth hormone, I will review our results in the study of how molecules can distinguish each other, showing the mechanisms by which receptors can selectively allow only some potential ligands to bind, and illustrating how a complex system of interactions arises, spanning from the atomic level to that of entire molecules.

BIOGRAPHY

Charo del Genio obtained his Laurea degree in physics in 2004 from the University of Naples “Federico II”, with a work in biophysics, modelling the interactions of cosmic rays with different materials to find out the best approach to shield astronauts from space radiation, with the aim of minimizing the DNA damage from incoming fragmented heavy ions. He then moved to the University of Houston, where he finished a PhD in statistical physics, defending a thesis in which he provided a theoretical explanation for the anomalous phase transitions observed in a family of defected materials, most notably Perovskites and high-Tc superconductors. During his PhD, he became interested in complex networks and algorithmic graph theory, developing in his spare time the first exact polynomial-time algorithm for degree-based graph sampling. After a position at the Max Planck Institute for the Physics of Complex Systems, he moved to Britain, first at the University of Warwick and then at Coventry University, before returning to Europe at Trakia University, in Bulgaria. While in Britain, he started applying his numerical expertise to problems in computational biophysics of molecular recognition. His main results include the exact solution to the problem of constructing graphs with prescribed degree correlations, which had been an open question for 40 years, as well as the extension of the Master Stability Function formalism to networks whose structure switches in time and to networks with multiple layers of interactions. In computational biophysics, he developed a tomographic molecular docking algorithm and determined a genetic mechanism that plants use to protect themselves from heat stress. More recently, he applied methods of statistical physics to molecular dynamics, revealing that the structure of intrinsically disordered proteins, which account for approximately 40% of all known proteins, does not necessarily consist exclusively of random coils, and that, instead, these proteins can be found in an ensemble of co-existing folded structures. Currently, he is studying problems of dynamical systems on networks, developing algorithms for the analysis of higher-order networks, and investigating how the local environment affects the properties of intrinsic disorder in proteins.



DECARBONASING ENERGY-INTENSIVE INDUSTRIES WITH DATA AND DIGITAL TWINS

Alessandro Parente

Ph.D., Aero-Thermo-Mechanics Laboratory, Ecole Polytechnique, Université libre de Bruxelles, Belgium



ABSTRACT

The decarbonization of high-temperature industrial processes, prevalent in sectors such as steel, glass, and cement, represents a significant challenge for achieving global climate objectives. Given the limitations of direct electrification, alternative decarbonization strategies are essential. Digital twins, which are virtual representations of complex systems, offer a promising avenue for the modeling and optimization of industrial combustion. These computational models integrate physics- based constraints with empirical data to provide predictions of system behavior across various operational scenarios.

This presentation will detail the development and application of digital twins for practical industrial combustion systems. By coupling physics-based principles and data-driven techniques, and leveraging sparse sensor data, these digital twins aim to enhance predictive accuracy for improved efficiency and reduced emissions. We explore methodologies for the continuous assimilation of heterogeneous data streams into these models, as well as the quantification of prediction uncertainties.

BIOGRAPHY

Alessandro Parente earned his Master's (2005) and PhD (2009) in Chemical Engineering from the Università di Pisa. He was a Research Associate at the University of Utah (2007–2009) and joined the von Karman Institute in 2009. Since 2010, he has been at the Université Libre de Bruxelles, where he became a Full Professor in 2019. Co-chair of the Brussels Institute for Thermal-Fluid Systems and Clean Energy (BRITE) since 2021, his research spans experimental and numerical studies of reacting and non-reacting flows, with applications in air quality and industrial decarbonization. He also leads efforts in using machine learning to enhance fluid flow simulations and develop digital twins, coordinating a European network (cypher.ulb.be) for decarbonizing hard-to-abate sectors.



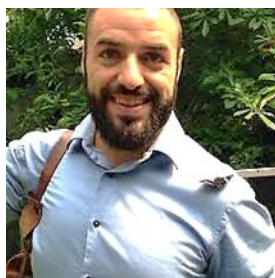
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WHEN LIGHT MEETS CIRCULAR BIOECONOMY: THE NEXT-GENERATION OF GREENER BIOFUELS

David Cannella

Ph.D., Université libre de Bruxelles, Belgium



ABSTRACT

Every time a single photon hits planet Earth, a complex set of reactions designed for capturing its energy starts running, igniting a chain of events whose outcomes are the photosynthetic oxygen, the growth of biomass through reduction of carbon dioxide, and ultimately the origin of life. To close its cycle, carbon-hydrogen bonds need to be oxidized and returned to the atmosphere, and this is one of the most difficult reaction to control yet able at providing us perhaps the cleanest source of bioenergy, for example by converting methane to methanol. For many years the scientific community tried to harness the energy of Sunlight through artificial photosynthesis mostly to catalyse the photolysis of water molecule to extract electrons as form of energy. Recently a new development seen the addition of enzymes as main biological catalyst to drive the conversion of reduced molecules into their oxidized forms, leading to the birth of the PhotoBioCatalysis field. In my lab we have demonstrated the applicability of such concept to drive the conversion of lignocellulose into bioethanol at the expenses of renewable light's energy, as well as the conversion of atmospheric methane to methanol, or organic waste into biodiesel.

BIOGRAPHY

D.C. graduated in Biotechnology in 2010 from La Sapienza University, Rome and obtained a PhD degree in biochemistry of natural resources from the University of Copenhagen (Denmark) in 2014, in collaboration with Chalmers University in Goteborg, Sweden. After becoming an independent researcher granted by the Danish Research Council, he spent research visiting at the CTBE and University of Sao Paulo, Brazil. In 2017 at the age of 32 was nominated assistant professor at the Université Libre de Bruxelles, Belgium. Today is associate professor at ULB at the Brussels school of Bioengineering/Faculty of Science. Here he founded the Biomass Transformation lab leading the cross-disciplinary PhotoBioCatalysis unit. His current research interests include: bioprocesses, biofuels, light driven biocatalysis with focus on biopolymers and biodegradable polymers, redox enzymes, CAZymes, valorisation of lignocellulose into plant active molecules, sustainable agriculture plant bio stimulants, sustainable agriculture, plant immune defences, and the biochemistry of the plant: pathogen warfare.



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LASER PHOTOACOUSTIC SPECTROSCOPY FOR FAST AND CONTACTLESS SENSING OF NERVE GASES

Luca Fiorani

Ph.D., Senior Researcher at ENEA, Physical Technologies and Security Division, Frascati Seconded National Expert in Disruptive Technologies at the European Commission, Directorate-General for Defense Industry and Space, Brussels, Belgium

ABSTRACT

The large-scale use of chemical warfare agents (CWAs) began during World War I and continues today, as seen in recent conflicts like the Syrian crisis and incidents such as the Skripal poisoning. Terrorists have also used nerve agents like sarin, which belongs to the organophosphate family—compounds also found in hazardous pesticides. Rapid detection of these substances is therefore essential. Laser photoacoustic spectroscopy (LPAS), a non-contact, non-destructive method, is being used by ENEA since 2017 for applications including food safety, and shows promise for detecting organophosphates. LPAS uses a modulated tunable laser to generate sound waves from samples, which are then analyzed using chemometric techniques. The system's output correlates with the compound's absorption spectrum, particularly effective in the IR “fingerprint region.” LPAS is rapid, sensitive, and cost-effective, and current systems based on quantum cascade lasers (QCLs) are portable and robust. Absorption at 7.9 μm is ideal for identifying organophosphates, while 9 μm poses interference issues. The study presents initial tests on nerve agent simulants, showing potential for detecting as little as 1 nl within minutes.

BIOGRAPHY

Luca Fiorani – PhD-Laser Sensing, MAS-CBRNe (with honours), MAS-Economics & Policy (with honours), CAS-Laser Safety, MSc-Physics (with honours) – is a senior researcher at ENEA and a policy officer at the European Commission. R&D at SLAC, CERN, University of Naples and CNR. Adjunct professor at Sophia University. Italian representative in PAME of the Arctic Council (2012-23), Chair of the Coastal Zones SIG of EARSel (2021-2023), member of: International Committee of EcoOne (1999-, Chair 2008-21), Global Council of LSM (2018-22), ISEG of NATO's Science for Peace and Security (2020-23), Agrifood Committee of AIPnD (2020-23), WG 5 “Safety, Security, Space & Defence” and 6 “Agriculture & Food” of Photonics21 (2022-23), WG 3 “Novel Mathematical Algorithms and Methods for Processing NDSS in Real Time” of SensorFINT (2022-23), Scientific Committee of NH (2023-), Governing Council of CLENAD (2025-). 106 peer-reviewed publications. 16 books.



BABOTS: BIOLOGICAL ANIMAL ROBOTS

Elio Tuci

Ph.D., Université de Namur, Belgium Faculty of Computer Science



ABSTRACT

One of the most recent and extremely exciting scientific and technological innovation is linked to the concept of biological animal robots, which refers to natural organisms whose neural substrate are structurally reconfigured to reprogram their behaviour. The development of this not-yet available technology (i.e., biological animal robots) is made possible by an interdisciplinary corpus of methods and practices in synthetic neuro-biology, genetics, and animal behaviour. In 2002, the EU-funded BABOTS project proposes to reprogram the behaviour of the round worm *C. elegans*, since this is an organism with a relatively small neural system (made of 302 neurons), with a complete map of neuron-to-neuron connectivity (i.e., the *C. elegans* connectome), and largely studied with a substantial knowledge of the functionality of some of its neural circuits. In this talk, I will illustrate the motivations and the objectives of the BABOTS project, the latest research results, and I will briefly mention the ethical issues related to the development and deployment of this technology.

BIOGRAPHY

E. Tuci is a professor at the University of Namur, within the Faculty of Computer Science. Prof Tuci has a Master degree in Experimental Psychology from the University of Rome “Sapienza” (Italy), and a PhD in Computer Science and Robotics from University of Sussex (UK). Prof Tuci has worked several years as postdoctoral researcher first at IRIDIA, the AI lab of the Free University of Brussels (ULB, Belgium), then at ISTC-CNR Rome (Italy). In 2010, he became lecturer in Computer Science at the Aberystwyth University (UK). In 2016, he moved to Middlesex University, London, as senior lecturer, and from September 2018 he has been employed first as "Chargé de cours" then as associate professor at the University of Namur, Belgium. Prof. Tuci is currently the director of the Robotics Lab (<https://www.naxys.be/robotics/>), a research unit currently made of 2 potDocs, and 6 PhD students carrying out research works in the domain of the development of control systems to automate various processes using robots, and on study of the mechanisms underlying individual and social cognition using computer-based models and robots. He has coordinated several national and internationally projects. Since 2023, Prof Tuci is the coordinator of the EU-funded PathFinder project “BABOTS: the design and control of small swarming animal robots” (<https://babots.eu/>).



DIGITAL TRANSFORMATION AND SUITABLE DEVELOPMENT. THE PRODIGEES PROJECT

Simone Lucatello

Ph.D., National Council of Science and Technology (CONACYT) Mexico, Coordinator Leader Report GEO 7 United Nations Program (UN) and Environmental (UNEP)

ABSTRACT

Digital transformation has become a defining force of contemporary global change, reshaping economic systems, institutional arrangements, and sociopolitical dynamics. While digital technologies present significant opportunities for achieving the Sustainable Development Goals (SDGs), particularly through improved service delivery, resource efficiency, and data-driven governance, they also introduce new forms of exclusion, inequality, and environmental externalities. The PRODIGEES Project (Promoting Research on Digitalization in Emerging Powers and Europe Towards Sustainable Development) addresses these complexities by critically examining the nexus between digitalization and sustainable development across diverse regional contexts.

Funded by the European Union's Horizon 2020 program and coordinated by the German Institute of Development and Sustainability (IDOS) and Instituto Mora (Mexico), PRODIGEES constitutes a transdisciplinary and multi-stakeholder platform connecting researchers and institutions from Latin America, Africa, Asia, and Europe. Its primary objective is to generate actionable knowledge on how digital innovation can align with inclusive and sustainable development, while addressing the risks associated with surveillance technologies, algorithmic bias, and digital asymmetries between and within countries.

The project adopts a co-creative research model grounded in collaborative foresight, empirical case studies, and capacity-building strategies. Key findings emphasize the importance of context-sensitive governance frameworks, digital ethics, and institutional adaptability in shaping equitable digital transitions. Furthermore, PRODIGEES highlights how digital infrastructures can either reinforce or transform existing power hierarchies, depending on their design and governance.

This abstract presents the project's theoretical contributions and empirical insights, demonstrating the relevance of cross-regional collaboration in addressing the normative and policy challenges posed by digitalization. Ultimately, PRODIGEES calls for a more inclusive global digital order—one that prioritizes rights-based approaches, environmental sustainability, and development justice in the governance of emerging technologies.

BIOGRAPHY

Simone Lucatello is a Senior Researcher at Instituto Mora (Mexico) and a leading expert in international environmental governance, climate change adaptation, and sustainable development. He holds a European PhD in Environmental Sciences from Venice University (Italy) and a Master Degree in International Relations from the London School of Economics and Political Science (LSE), UK. He has been actively involved in global scientific assessments, serving as a Lead Author for the Intergovernmental Panel on Climate Change (IPCC) of the UN and contributing to multiple UNEP reports, including GEO-6 and GEO-7. His research focuses on the intersections between climate change, environmental risks, social vulnerability, particularly in Latin America. Dr. Lucatello has published extensively in academic journals and edited volumes on climate policy, global governance, and disaster risk



reduction. He also participates in international research networks and policy dialogues promoting sustainability and resilience in the Global South. Founder and former president of ARIM, the Association of Italian Researchers in Mexico. In 2021, Lucatello was awarded the title of Knight of the Order of the Star of Italy by President Sergio Mattarella in recognition of his scientific contributions and support in strengthening Italy's international relations.



NAVIGATING FROM SICILY TO SEMICONDUCTOR INDUSTRY LEADERSHIP

Angelo Pinto

Ph.D., IEEE Fellow, Vice President of External Manufacturing Production (EMP) at Intel, San Diego, California, USA



ABSTRACT

Beginning in Sicily, my journey through bachelor studies in Nuclear Physics and Ph.D. studies in Solid State Physics fueled my interest in applied Semiconductor Physics and its boundaries. My academic pursuits led me to device engineering in Bipolar research, where I advanced SiGe Heterojunction Devices in the RF application space.

This experience paved the way for driving the development of the world's most advanced SiGe BiCMOS technology, further extending the boundaries for RF and precision-analog in mass production. From this foundation, I transitioned to developing specialized characterization tools to enhance technology performance and manufacturing yield in the production of VLSI SoC.

This progression led to a leadership role in Design Technology Co-Optimization and Power Performance Area for advanced communication technology, including the first CMOS FinFET mobile product in the company's history. Today, I lead a team of technologists at Intel Corporation in manufacturing the world's most advanced microprocessors. Each step presents new technologies with unique challenges and fascinating barriers to overcome.

BIOGRAPHY

Dr. Angelo Pinto is the Vice President of External Manufacturing Production (EMP) at Intel, where he leads global operations focused on high-volume foundry and OSAT manufacturing, accelerating Intel's hybrid IDM strategy. Dr. Pinto holds a bachelor's degree in Nuclear Physics and a Ph.D. in Solid State Physics from the University of Catania, Italy.

With over 28 years of experience, Dr. Pinto has held several critical engineering and technology leadership roles. He began his career at ST Microelectronics, leading the advanced semiconductor bipolar research group and developing high-speed SiGe heterojunction bipolar transistors for RF applications. At Texas Instruments, he spearheaded the development of the industry's most advanced SiGe Complementary-BiCMOS technology for RF/A products, leading



to high-volume manufacturing of high-precision analog chips. At PDF Solutions, he specialized in tools, systems, and methods for yield enhancement in VLSI advanced logic manufacturing.

Prior to Intel, Dr. Pinto served as Senior Director at Qualcomm, managing 5nm technology nodes for mobile SoCs and overseeing Design Technology Co-Optimization (DTCO) and Performance Power Area (PPA) scaling. He also led the global test-chip design team for SoC IP validation. During his tenure at Qualcomm, Dr. Pinto led numerous New Product Introduction (NPI) projects from 250nm to 3nm, including Qualcomm's first FinFET CMOS product with Samsung at 14nm.

Dr. Pinto has authored 19 articles, holds over 44 patents, and has served as Chair of the Yield & Manufacturing Committee for the IEEE Electron Devices Technology Manufacturing (EDTM) conference and as a Member of the Process Technology Committee of the IEEE Bipolar and BiCMOS Circuit Technical Meeting (BCTM) conference. In 2024, Dr. Angelo Pinto was elevated to the prestigious rank of IEEE Fellow, a testament to his extraordinary contributions to semiconductor technology, technical leadership, and the adoption of FinFET technology into high-volume manufacturing for smartphone microchips.



DECODING THE UNSPOKEN: HOW FACIAL CODING REVEALS CONSUMER PERCEPTION AND DRIVES MARKET SUCCESS

Marco Baldocchi

Founder and CEO, Marco Baldocchi Group Inc. of Miami, USA

ABSTRACT

Consumer choices are often driven by unconscious perceptions rather than rational analysis. While traditional research methods capture explicit opinions, they fail to decode the emotions that truly shape purchasing decisions. This is where Facial Coding becomes a game-changer in applied neuroscience.

Facial Coding allows us to analyze microexpressions—brief, involuntary facial movements that reveal authentic emotional reactions to a product. These reactions, rooted in the limbic system, are immediate and uncontrollable, making them a powerful tool for understanding how consumers truly perceive a product.

This study presents a real-world case where an Italian Fast-Moving Consumer Goods (FMCG) brand used Facial Coding to refine its market entry strategy in the U.S. By decoding subconscious emotional responses, we measured the true perception of the product and identified the emotional barriers to purchase.

Facial Coding in Action: A Case Study

The research was conducted in Los Angeles and Dallas, involving a diverse group of 40 participants. Our goal: understand how consumers perceive the product beyond verbal responses and identify hidden insights for strategic adjustments.

Key Findings: What the Face Reveals About Perception

- **Authentic Emotional Responses** → A product perceived as high-value elicited dominant happiness (35% intensity), confirming a strong market fit.
- **Negative Emotional Triggers** → A disconnect between expected and actual price generated anger (50% intensity), revealing a misalignment in perceived value.
- **Speed of Emotional Processing** → Microexpressions of surprise and engagement peaked within 0.47 seconds, proving that the first emotional reaction is crucial in consumer decision-making.

Unlike explicit surveys, where consumers rationalize their choices, Facial Coding provided a window into their true, unfiltered perception.

Why Neuroscience is Reshaping Market Strategy



This case demonstrates how applied neuroscience enhances market intelligence beyond traditional research methods. Facial Coding allows brands to:

- Identify hidden emotional drivers behind consumer choices.
- Refine product positioning based on real emotional engagement.
- Eliminate perception gaps that create friction in the purchase process.

Understanding the unspoken emotional response is the key to aligning product perception with consumer expectations, making neuroscience an essential asset in strategic decision-making.

Conclusion: The Power of Facial Coding in Consumer Behavior

In a world where purchase decisions are emotional first, rational second, Facial Coding gives brands a scientific advantage in shaping consumer perception. By decoding what consumers feel but don't say, we transform unconscious reactions into actionable business insights.

This is how neuroscience becomes a competitive edge, helping companies penetrate markets with products that speak directly to the consumer's emotions.

BIOGRAPHY

Marco Baldocchi, founder and CEO Marco Baldocchi Group Inc. of Miami.

Director of Neuromarketing Research for the Italian National Association of Applied Neurosciences.

Founding member and Head of the Research Department for Oncems (Italian Communication and Marketing Observatory for Sustainability).

Author of books and scientific publications. Speaker at national and international events. Lecturer at the 24Ore Business School and the Catholic University of Milan.

Member of the NMSBA (Neuromarketing Science & Business Association) he was included in the Top 10 of the Best World Speaker - Neuromarketing Series 2021.

Member of the MSIC (Italian Scientific Community of Miami).

Member of the AINEM (Italian Association of Neuromarketing)

In 2023 he was included in the prestigious Insight250 ranking, a collection of the best 250 international experts in marketing and consumer behavior.

In the same year, he was selected for inclusion in the international edition of Marquis Who's Who, a renowned American directory that lists prominent individuals in various sectors, ranking in the top 3% in the world in the field of consumer behavior, neuromarketing & neurobranding.

In 2023 he was TedX Speaker in Miami (US) and Lucca (Italy).

His company has been nominated the 'Most Scientific Marketing Agency 2023 - Southeast USA' award at the 'Media Innovator Awards 2023'.



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PREDICTING HOW GLASSES AGE FAR FROM EQUILIBRIUM

Federico Caporaletti

Ph.D., Laboratory of Polymer and Soft Matter Dynamics, Université libre de Bruxelles (ULB), Brussels, Belgium.

ABSTRACT

Glasses have a disordered atomic structure and are typically formed by rapidly cooling a liquid to prevent the atoms from organizing into a crystal lattice. While exhibiting a liquid-like structure at the microscopic scale, glasses appear as rigid solids at the macroscopic level. Due to their unique properties, glassy materials are essential in various applications, including pharmaceutical compounds, electronic device screens, and organic semiconductors.

Glasses are inherently out-of-equilibrium systems and as such, even under chemically inert conditions they tend to evolve towards more stable configurations. This relaxation phenomenon, known as physical aging, significantly alter material properties over time: it is therefore of both technological and fundamental interest to understand how glasses “age”.

Aging kinetics, at the state of the art, is well described only when it occurs after minor perturbations from equilibrium. Current frameworks fail instead to describe how amorphous materials age under realistic processing conditions, such as after large temperature variations occurring within short intervals of time. By analysing the evolution of thermal barriers in aging glasses, we developed a model that predicts aging behaviour far from equilibrium across various temperatures and processing conditions. Our approach requires at most, the outcome of just a single aging experiment, and it is able to predict the timescale at which materials start aging, even well below the glass transition temperature. These results provide new insight on the equilibration pathways of glasses, their enhanced mobility and provide a framework to predict material performance under nonequilibrium conditions.

BIOGRAPHY

Federico Caporaletti earned his Ph.D. in Physics from the University of Trento (Italy) in 2020. He then worked as a postdoctoral fellow at the Van der Waals-Zeeman Institute and the Van 't Hoff Institute for Molecular Sciences at the University of Amsterdam. Currently, he is a senior postdoctoral researcher at the Université Libre de Bruxelles, supported by an F.R.S-FNRS fellowship.

His research focuses on the structure and non-equilibrium dynamics of supercooled liquids, polymers and bio-macromolecules across liquid-to-glass and liquid-liquid transitions. He explores these phenomena and investigates the connection between molecular dynamics and macroscopic material properties using ultra-fast spectroscopy, X-ray inelastic scattering, dielectric spectroscopy, and calorimetry.

An updated list of publications can be found in <https://tinyurl.com/49su6trz>



EVACUATION TIMES IN URBAN CABLE CARS UNDER SIMULATED CONDITIONS, IN THE FACE OF RISK SCENARIOS

Franco Grasso

Ph.D., Director de IWR Academy y Ronin Lift México

ABSTRACT

Urban cable cars are a transport system derived from the most widely used systems in mountain areas and are currently booming due to their ability to increase resilience in marginalized areas of large cities, where they operate with very high numbers of passengers. However, these cable transportation systems bring with them operational risks that have been little evaluated and that are important to manage: one of them is the possibility of determining the evacuation time within the parameters defined by the international standard (EN 1909:2017), and knowing how to manage emergency or disaster scenarios, derived from the prolonged stoppage of the cable transport system. The present research consisted of measuring the evacuation times in a simulated circuit, on a cable car-type scale, in two conditions of “day” and “at nightfall”. The values obtained were analyzed to determine their statistical significance between the conditions of “day” and “at nightfall”, which was not found: therefore, the value of the average time in both conditions could be established. Furthermore, with the data from the times found for the different phases of the vertical rescue procedure, a formula was developed that allows calculating the vertical evacuation times of an urban cable car type gondola, which turns out to be necessary to design an evacuation plan, considering the times required by the teams of rescue technicians to evacuate the entire cable car.

BIOGRAPHY

Bachelor's degree in Psychology with a Master's degree in Educational Psychology from the Università degli Studi di Torino; Master's degree in Sports Psychology from the University of Distance Studies in Spain. He is currently completing a Ph.D. in Comprehensive Risk Management from the National School of Civil Protection. He began his career with the Italian Alpine Club more than 30 years ago, and in 2004, he founded the National School of Mountaineering and Alpine Rescue in Mexico. With various international certifications in work and rescue at heights, he currently directs the IWR Academy, an institution specializing in occupational health and safety that collaborates with CONAHCYT and national and international universities. He is also Head of the Vertical Rescue Department at Topos Birta in Mexico and a member of the Scientific Technical Committee of the Italian Association of Vertical Work (AIOLaF). He has published several lines of research and international publications on safety and rescue at heights.



NO_x EMISSION PREDICTION IN AMMONIA-HYDROGEN COMBUSTION VIA CHEMICAL REACTOR NETWORKS

Asija Tatiana Inciardi

Ph.D. Researcher at the Université libre de Bruxelles and Université Catholique de Louvain

ABSTRACT

Climate change poses significant challenges, prompting policies for carbon neutrality by 2050. Renewable energies, particularly hydrogen as a Smart Energy Carrier (SEC), offer high efficiency and zero direct CO₂ emissions. However, its combustion creates challenges, such as increased nitrogen oxide NO_x emissions, necessitating innovative combustion technologies for cleaner use. Chemical Reactor Networks (CRNs) provide an effective approach for simulating detailed kinetic mechanisms with reduced computational demands. The CRN method, divides the combustor into discrete compartments that represent homogeneous flow zones, modelled as Perfectly Stirred Reactors (PSRs) or Plug Flow Reactors (PFRs). The reactors, interconnected by mass and heat exchanges, form a network designed to preserve the main characteristics of the global flow field. Data for CRNs can come from semi-empirical relationships or CFD simulations. The combined CFD-CRN method effectively predicts pollutant emissions, while statistical techniques for the compression and classification of data, like Principal Component Analysis (PCA), help automatically select features and group observations.

This work focuses on investigating how CRN structures evolve under varying input conditions, particularly in ammonia-hydrogen mixtures, and examines their impact on nitrogen oxide (NO) emission predictions. Moreover, it explores the identification of a representative network that can generalize across multiple operating conditions. By integrating data-driven clustering methods with CRN modelling, this study aims to enhance the accuracy and efficiency of emission predictions in complex reacting flows.

BIOGRAPHY

Asija Tatiana Inciardi is a young Ph.D researcher, at the Université libre de Bruxelles and Université Catholique de Louvain, in the field of numerical modelling of combustion systems. His work focuses on the development of reduced order models coupling physical models and machine learning, resorting to the use of Chemical Reactor Networks, which allow for pollutant and field predictions at a reasonable computational cost. Asija work especially focus on the use of ammonia-hydrogen blends in industrial furnaces, aiming to assess the material impact of such mixtures, while maintaining low pollutant emissions.



Marcello Maniglia

Ph.D., Assistant Research Psychologist, UC Riverside, California, USA

ABSTRACT

The human brain possesses a remarkable ability to turn basic light inputs into complex perceptual experiences while constantly adapting its structure and function to acquire new skills or compensate for sensory loss. This dynamic interplay between structured processing of incoming information and plastic changes in response to stimuli and environment profoundly intrigued me and laid the foundation of my journey into vision science.

Since my PhD in Italy, my research has focused on the mechanisms underlying the enhancement, refinement, and adaptation of sensory, oculomotor, and attentional abilities within the visual system. I employ a broad range of methodologies, including psychophysics, eye tracking, brain stimulation and neuroimaging techniques to explore these questions in both healthy and in low vision, characterizing both training-induced and spontaneous compensatory plasticity in Macular Degeneration (MD).

Three main areas of contribution are:

1) *Visual training and neural plasticity*

My research on visual perceptual learning explores how training-induced plasticity extends beyond basic perceptual improvements, involving distributed brain processes rather than a simple high- vs. low-level distinction. Through behavioral and neuroplasticity studies, I investigated factors that drive learning generalization, improve performance, and enhance accessibility of vision training, including a large-scale NIH-funded project to develop tablet-based interventions for individuals with low vision.

2) *Brain changes following loss of central vision*

I also investigate how the brain adapts to central vision loss, both spontaneously and through training, to inform clinical interventions for conditions like MD. Supported by grants from the Fouassier Foundation, Fondation de l'Avenir and NIH, my research has shown long-lasting improvements with visual training, developed novel diagnostic tools, and contributed to the characterization attentional and perceptual training effects in MD. More recently, I have used gaze-contingent displays to simulate central vision loss and study compensatory oculomotor strategies in controlled settings. This has led to novel methods for characterizing eye movement adaptations, and an NIH-funded project developing eyetracker-based assessment and training for MD.

3) *Mechanisms of visual perception*

My early research explored contrast- and motion-dependent perceptual phenomena, including adaptation and after-effects, providing the first comprehensive characterization of contextual modulation in peripheral vision.

BIOGRAPHY

I am an Assistant Research Psychologist at UC Riverside (CA, USA) and incoming Assistant Professor at the Rochester Institute of Technology (RIT). I earned my PhD in Experimental Psychology from the University of Padova (Italy) and have conducted postdoctoral research at CerCo (France), UC Riverside, and the University of Alabama at Birmingham (UAB).



A BRAIN-ON-CHIP PLATFORM FOR STREAMLINING CLINICAL TRANSLATION OF GENE THERAPIES FOR NEUROLOGICAL DISORDERS

Giulia Massaro

Ph.D., FHEA, UCL School of Pharmacy, University College of London, UK

ABSTRACT

Organ-on-chip devices are microfluidic systems that mimic the human physiological microenvironment, where human cells are grown in small 3D structures resembling human organs. These platforms represent a promising toolbox for disease modelling and could be utilized to replace animals in early stages of drug screening. One of the main challenges in current drug development is the low permeability of the blood-brain-barrier (BBB). The BBB is a selective barrier which protects the brain but also prevents effective drug penetrance. This has hindered research into drug discovery for neurodegenerative diseases, as many drugs have physical and chemical limitations preventing crossing of the BBB. Viral vector-mediated gene therapy has partially overcome this challenge. In particular, adeno-associated viral vectors (AAVs) can cross the BBB and are currently employed in many clinical trials in the UK and three commercialised products for neurological conditions, with thousands of patients treated worldwide. In nonclinical studies, animal models frequently do not recapitulate the human response to AAV and other pharmacological treatments due to interspecies differences, leading to unexpected clinical outcomes in terms of gene expression or therapeutic efficacy.

The aim of our project is to:

- develop a flexible and physiologically relevant brain-on-chip model of a neurodegenerative disorder, neuronopathic Gaucher Disease (nGD), using differentiated human-derived induced pluripotent stem cells (iPSCs) from patient fibroblasts;
- demonstrate its ability to recapitulate the effects of AAV-GBA gene therapy previously established in our group in the disease mouse model.

These devices can 1) increase physiological relevance and reproducibility of an *in vitro* screening model by utilizing human cells, 2) reduce time and cost of nonclinical testing by developing a flexible and adaptable platform, and 3) reduce the number of animals to increase sustainability.

BIOGRAPHY

[Dr. Giulia Massaro](#) is a Lecturer and Principal Investigator at the UCL School of Pharmacy, specializing in gene therapy for neurometabolic diseases. Dr Massaro's expertise spans viral vector technology, bioengineering, and translational research, with a strong focus on AAV-mediated gene therapy. Dr Massaro has played a pivotal role in optimizing AAV-based therapies for lysosomal storage disorders and establishing the UCL NeuroGTx Viral Synthesis Facility, where she has developed a scalable viral vector manufacturing pipeline. Her group is now focusing on developing human brain-on-chip platforms to enhance translational success in gene therapies for rare disorders.

Dr Massaro serves on the Executive Board of the Association of Italian Scientists in the UK and the British Society for Gene and Cell Therapy.



NUMERICAL INVESTIGATION OF METHANE/HYDROGEN COMBUSTION IN A SMALL-SCALE MICRO GAS TURBINE

Alessandro Piscopo

Ph.D. Researcher at the Université libre de Bruxelles

ABSTRACT

The current energy sector has to adapt, in the context of the energy transition, to reduce harmful pollutant emissions such as carbon dioxide (CO_2) and nitrogen oxides (NO_x). The defossilization introduced a significant share of renewables in the European energy mix. Nevertheless, renewables are characterised by intermittency due to their dependency on uncontrolled and non-dispatchable sources such as wind and sun. An option to mitigate this effect is to decentralise energy production, mainly by using small-scale units with faster response times, thus offering higher flexibility. Micro gas turbines (mGTs) have a role to play in that aspect of heat and electricity production, as their flexibility can help in coping with the significant amount of variable renewable energy. mGTs burn mainly natural gas, resulting in CO_2 production. To reduce the CO_2 emissions, the carbon can be removed from the fuel, and a good candidate is hydrogen. The properties of natural gas (or methane) and hydrogen are, however, very different, mainly in terms of adiabatic flame temperature, lower heating value (LHV), and density. The switch from methane combustion to hydrogen combustion is not straightforward and the impact of hydrogen addition in the fuel should be investigated. To this end, we investigate a partially premixed $20 \text{ kW}_{\text{th}}$ mGT combustor of a 3.2 kW_e machine. Experiments were used to validate the numerical methodology. Various operating set-points are available for methane combustion, while blends were burned only at full load, until the current official limit of the machine ($23\%_{\text{vol}} \text{ H}_2$). Computational Fluid Dynamics (CFD) simulations were used to assess the effect of adding hydrogen to the fuel. While the numerical model correctly predicts the CO_2 levels obtained in the experiments, it struggles to match the CO emissions, especially for pure methane combustion, which suggests limitations in the turbulence-chemistry interaction approach used.

BIOGRAPHY

Alessandro Piscopo is a Ph.D. researcher, at the Université libre de Bruxelles, in the field of numerical combustion modelling for sustainable fuel implementation in existing combustion chambers. His work focuses on developing advanced approaches for accurate representation of the combustion process of sustainable fuels such as ammonia and hydrogen. With several publications in leading journals, Alessandro has contributed to the understanding of finite rate effects and pollutant emissions in different technologies. His research aims to support the transition toward cleaner energy.



CORAL RESPONSE TO CLIMATE CHANGE

Federica Scucchia

Ph.D., Associate in the Putnam Lab at the University of Rhode Island, USA

ABSTRACT

The alarming rate of climate change demands new management strategies to protect coral reefs. Environments such as mangrove lagoons, characterized by extreme variations in multiple abiotic factors, are viewed as potential sources of stress-tolerant corals for conservation strategies such as assisted evolution. However, biological trade-offs for adaptation to such extremes are poorly known. We investigated reef-building corals living in both mangrove and reef sites in Australia and showed that stress-tolerance in mangrove corals comes with compromises in genetic and energetic mechanisms and skeletal characteristics, including reduced genetic diversity and symptoms of metabolic energy redirection to stress response. These findings demonstrate the need for caution when utilizing stress-tolerant corals in human interventions, as current survival of these so-called “super corals” in extreme environments may actually compromise their future fitness.

BIOGRAPHY

I'm a Marine Biologist currently working as a Postdoctoral Associate in the Putnam Lab at the University of Rhode Island (US). My research is focused on assessing core physiological and molecular traits underlying thermal tolerance across coral species. I previously worked as a Postdoctoral Associate in the Martindale Lab at the Whitney Laboratory for Marine Bioscience, University of Florida (US). My research focused on utilizing a transgenic sea anemone as a model in vivo system to express intrinsically-disordered proteins and study their role in biomineralization. I completed my Ph.D. in 2023 in Prof Tali Mass' Lab at the University of Haifa, Israel. I worked on assessing the influence of environmental factors on the physiology, calcification and gene expression of stony corals across life stages.

I pursued my Master's in Marine Biology under a joint program between the University of Bologna, Italy, and the University of California Santa Barbara (UCSB), USA, where I focused on studying coral biology. While at UCSB, I obtained the Scientific Diving certification of the American Academy of Underwater Sciences.

Throughout my career, I've obtained several funding and awards for research and travel, including the prestigious Aharon and Ephraim Katzir Grant of The Israel Academy of Sciences and the Oren Berko Prize for Excellence. I've been invited to give talks at multiple conferences across countries, including the Gordon Biomineralization Conference in the US and Spain, the DFG Priority Programme “Tropical Climate Variability & Coral Reefs” in Germany and the Goldschmidt Conference in Hawai'i.

My skills and expertise are molecular biology, transcriptomics, scanning electron microscopy, synchrotron imaging, 3D biological data visualization using AI, cloning and transgenesis.



AI REGULATION: AN ISRAELI PERSPECTIVE

Michael Sierra

Ph.D. Student, The Hebrew University of Jerusalem & Researcher at Israel Democracy Institute
Legal Assistant to the Vice President of the Court, Jerusalem, Israel

ABSTRACT

The regulation of artificial intelligence (AI) is a pressing legal and ethical challenge worldwide, and Israel is no exception. While the European Union has taken a structured approach with the AI Act, Israel's regulatory framework for AI remains in development. This paper examines the current state of AI regulation in Israel, its legal foundations, and the challenges posed by AI in various legal domains.

The discussion begins with an analysis of AI-related legal dilemmas in Israeli law, covering public, private, and international aspects. Key issues include discrimination by AI systems, liability in cases involving autonomous technologies, and the intersection of AI with intellectual property law. Additionally, the paper explores the unique characteristics of the Israeli legal system, which combines elements of common law and civil law traditions, shaping its approach to AI governance.

Comparisons with international AI regulatory frameworks, particularly the European AI Act, highlight Israel's position in the global regulatory landscape. The EU's risk-based categorization of AI systems provides a potential model for Israel, yet Israel's regulatory approach must account for its distinct legal culture, technological landscape, and security considerations. Existing laws, such as the 1995 Computer Law and privacy regulations, provide a partial foundation, but comprehensive AI-specific legislation is still lacking.

The paper also considers how Israeli courts have addressed AI-related disputes, including cases such as *Adalah v. Cyber Unit* (2021), which reflect broader concerns about governmental use of AI and fundamental rights protections. The role of AI in public administration, law enforcement, and defense further complicates the regulatory landscape, requiring a careful balance between technological innovation, security interests, and human rights.

Finally, the paper evaluates potential pathways for AI regulation in Israel, including legislative proposals, judicial interpretations, and sector-specific guidelines. It discusses whether Israel should adopt a flexible, adaptive regulatory framework similar to the EU's AI Act or a more sector-specific approach tailored to its unique needs.

By analyzing Israel's regulatory approach within the global AI governance discourse, this paper aims to contribute to the broader discussion on AI law, offering insights into how small but technologically advanced nations can navigate AI regulation in a rapidly evolving landscape.



BIOGRAPHY

EDUCATION

THE HEBREW UNIVERSITY, Jerusalem, Israel

2018-2022

- **Bachelor of Law, LL.B.** (equivalent to J.D.); **LL.M.** (Magna cum laude)
- **Bachelor of Arts**, International Relations
- Graduated magna cum laude
- Academic Seminars: Intellectual Property and Networks (highest grade in class); Freedom of Speech and digital platforms
- **Board Member**, “Hukim” Law Review
- **President**, Law and Technology Club
- **Member**, Human Rights Legal Clinic [drafted an alternative report to the Committee on the Rights of the Child]
- **Board Member**, Israel Law Review
- **PhD student** under the supervision of prof. Yuval Shany and Dr. Renana Keydar

PROFESSIONAL EXPERIENCE

JERUSALEM DISTRICT COURT

2024-present

Legal Assistant to the Vice President of the Court

- Drafted Judgments on a variety of issues and mainly class actions regarding vehicles
- Working closely with the judges, including attending hearings
- Analyzing complex material

AGMON WITH TULCHINSKY LAW FIRM

2022-2023

Mandatory (salaried) Legal Intern (Articled Clerk)

- Selected from 1,000 applicants
- Drafted and finalized appeals in civil and administrative cases, as well as constitutional petitions
- Analyzed complex arguments and evidentiary materials
- Work with Israeli banks and international clients on major commercial class actions
- Member of team representing China Civil Engineering Construction Corporation
- Lead case strategy, litigate and mediate for plaintiffs in high-profile tort cases, including the Museum of Tolerance against the Jerusalem’s Municipality
- Represent venture capital funds, Israeli start-up and high-tech firms, their international subsidiaries, and Israeli company going public on NYSE
- Work largely in English, as most clients are international; prepare legal opinions and assure compliance
- Assigned substantially more responsibility and greater independence than others at same level
- Selected for special projects, including defense team in complex international litigation



THE HEBREW UNIVERSITY Research Assistantships:

2020-2022

- Dr. Renana Keidar and Dr. Noa Mor – Content moderation, risk assessment, regulation, (2022-present)
- Prof. Robbie Sabel – Public international law, (2022)
- Israel Supreme Court, Israeli Courts Research Division - Empirical analysis of the Supreme Court hearings broadcast project, (2020-2022)
- Dr. Shaul Cohen - The criminal law act, (2020-2021)
- Prof. Shahar Lifshitz and Dr. Ram Rivlin - The laws of marital property at the time of death], (2020-2021)
- Dr. Yaniv Vaki - A comparative research on reasonable doubt, (2020-2022)
- Prof. Nahum Rakover - The regulations of the Jewish communities regarding permitted matters, (2020-2022)
- Prof. Yaniv Vaki – drafted chapter on the Reasonable Doubt (David Law ed., Cambridge Univ. Press 2020)
- Jewish law research for Professor Nahum Rakover; work includes:
 - o Nahum Rakover, Community Regulations Against Luxury, Sifriat Hamishpat Ha'ivri (2022)

Teaching Assistantships:

- **Faculty of Law:** Intellectual Property (Prof. Michal Shur-Ofry (2022-present); Public International Law (Prof. Tomer Brode and Prof. Guy Harpaz, Prof. Moshe Hirsch) (2020-2022); Roman Law (Dr. Rachelle Hassan) (2020-2022)
- **Faculty of Social Sciences,** Research Methods (Dr. Roni Porat) (2019-2020)
- **Responsibilities:** developing lesson plans, providing student feedback, conducted lectures & office hours, drafted and graded assignments and exams

ISRAEL DEFENSE FORCES, COGAT (Coordination of Government Activities in the Territories) 2015-2018

Aide to Head of Foreign Relations and International Organizations Branch; Rank: Sergeant

- Headed team coordinating diplomatic missions with countries including US and in Europe
- Produced policy, strategy, and intelligence briefs
- Coordinated trilateral working group (Israel, Netherlands, Palestinian Authority) on energy, water management, and border crossings; as a result, new scanners were installed at border crossings, increasing import/export by 67%
- Facilitated Japanese-Jordanian-Palestinian-Israeli regional economic initiative, Corridor for Peace and Prosperity; helped establish Jericho Agro Industrial Park, generating 2,000+ jobs
- Produced policy recommendations for strategic meetings with officials/ministers from 60+ nations and organizations, including then-UN Secretaries General Ban Ki-moon and António Guterres
- Organized international donors to generate \$45M for Syrian civilian aid project, providing 1,000 tons of food, fuel, and hospital supplies
- Liaised with US Security Coordinator and Italian Carabinieri to train Palestinian Security Forces on counter terrorism, increasing operational effectiveness by 13%



COMMUNITY ACTIVITIES AND VOLUNTEERING

ITALIAN JEWISH COMMUNITY IN ISRAEL (2015-present)

- Youth Movement Founder, head of the Youth Board, and current Board member
- MINYANIM** International Fellowship of the Jewish Agency (2019-2020) – Obtained leadership certificate
- BIRTHRIGHT ISRAEL** (2018) – Managed logistics for international groups traveling through Israel
- BET MIDRASH BARKAI** (2015-2022) – Volunteer educational facilitator
- LIMMUD ITALIA** (2015 Organizer for festival of Jewish learning for Italian speakers
- ISRAEL NATIONAL SCOUTS** (2011-2014)
 - Led 4 groups of 40, including special-needs teens, in summer camps and leadership training activities
 - International Delegations Committee – organized events for international delegations visiting Israel

PUBLICATIONS AND LECTURES

Michael Sierra, Israel Constitutional Reform, An Explanation, lecture at Italian Pro-Israel Association, Brera Center, Milan

(2023)

Michael Sierra, The Constitutional Reform Proposal that Causes Israel to Debate, Well-explained, Kolot Review, 1

(2023)

Michael Sierra, Criticism of the Practice of Comparative Law in the Analysis of the Doctrine of Non-constitutional Constitutional Amendment, The Israeli Law and Liberty Forum (2021) (3rd place in articles competition)

Michael Sierra, The Principle of Equality in the Rulings of the Israeli Supreme Court, Dossier for 75 years of the Italian Constitution (2023), Laterza [Forthcoming, in Italian].

Michael Sierra, AI and the law – an Israeli perspective, lecture at AISSI (The Association of Italian Scholars and Scientists in Israel), Jerusalem (2024)

Michael Sierra, review of the book Prove di convivenza. L'istituto della cittadinanza nell'ordinamento giuridico israeliano, La Rassegna Mensile di Israel (2024)

Freelance Journalist: Various legal articles, under my byline, in the publications Yediot Yerushalayim and the Italian Union of Jewish communities' review (UCEI – Pagine Ebraiche)

ADDITIONAL INFORMATION

Languages: Hebrew, Italian, English; **Citizenships:** Israeli and Italian; **Certifications:** Israeli Bar, February 2024

Interests: Reading, Writing



SPATIO-TEMPORAL DISSIPATIVE SOLITONS IN OPTICAL CAVITIES: FREQUENCY COMBS AND LIGHT BULLETS

Mustapha Tlidi

Research Director at the Fonds National de la Recherche Scientifique (Belgium) and Professor at ULB

ABSTRACT

Faculté des Sciences, Département de Physique, Université Libre de Bruxelles (U.L.B), CP. 231, Campus Plaine, B-1050 Bruxelles, Belgium

In the tradition of the Prigogine Brussels school, where I did my first work as a physicist, I learned to apply the concepts of nonlinear dynamics to a specific system without losing the link with the first principles of physics. So far, my work has focused on dissipative structures in nonlinear optical systems. More specifically, their formation, manipulation and interactions in dissipative, diffractive and nonlinear optical resonators subjected to a continuous laser pump.

The formation of localized structures (LS) in optical resonators is a hot topic in the field of nonlinear optics. SLs, also known as dissipative solitons, have been proposed for all-optical information processing using optical resonators. One of the first theoretical works on SLs showed the potential of their applications. These structures consist of light or dark pulses in the plane orthogonal to the propagation axis. This theoretical prediction was confirmed by experimental evidence. Localized structures were studied (spatial SL) first around the boundary point associated with optical bistability and then in the Lugiato-Lefever equation (LLE). This model has established itself in the literature as a paradigm for understanding complex phenomena in dissipative, non-linear optical resonators.

Next, LLE, in the longitudinal dimension, was the subject of theoretical and experimental studies on switching waves in an optical bistable. The experimental set-up consists of non-synchronously pumped fiber ring resonators. More recently, SLs have been observed in the longitudinal dimension (temporal SL). Beyond information processing, temporal SLs are at the origin of frequency combs. It should be noted that Hansch and Hall were awarded the Nobel Prize in Physics in 2005 for their pioneering work on optical frequency comb technology. These combs are expected to revolutionize the generation of ultra-stable lightwave and microwave signals for aerospace engineering, optical communication networks and microwave photonic systems. The relationship between SL and frequency combs has only recently come to light and is, in my opinion, one of the most interesting aspects of this question.

The combined influence of diffraction in two transverse directions and dispersion in the longitudinal direction led to the generalization of the LLE model. The study of this equation has led to the identification of localized three-dimensional structures (light bubbles) corresponding to the confinement of light in all three directions. We not only examine the stability properties of these localized structures, which can give rise to rogue waves, but also establish a link with fluids. The interdisciplinary nature of the question posed offers great potential for research in disciplines far removed from one another, such as photonic devices, statistical physics and the non-linear dynamics of dissipative systems, as well as their link with the phenomenon of self-organization in hydrodynamic systems.



MEDICINE



MODERATOR



Andrea Giuffrida

Ph.D., MBA, Senior Vice President for Research & Biotechnology Western University of Health Sciences, California, USA

Dr. Andrea Giuffrida is a distinguished academic leader currently serving as the Senior Vice President for Research & Biotechnology and professor of pharmacology at Western University of Health Sciences (WesternU) in California. He received his Ph.D. in evolutionary biology from the University of Catania, Italy, and an executive master's in business administration from the University of Texas San Antonio. In 2011, he served as an AAAS Science & Technology Policy Fellow in the Office of Science Policy at the National Institutes of Health (NIH) working on the regulatory science of biomedical products and drug development. During that time, he also played a pivotal role in shaping the NIH biannual report to the American Congress. Between 2014 and 2021, he held the position of vice president for research at the University of Texas Health Science Center San Antonio. Currently, at WesternU, Dr. Giuffrida oversees the university's research infrastructure and operations, regulatory compliances, clinical trials, sponsored programs, and technology commercialization. Moreover, he serves as the university liaison for matters related to research advocacy and education, strategic partnerships, and corporate research sponsors. As a scientist, Dr. Giuffrida has provided important breakthroughs to the neuropharmacology of the cannabinoid system and its role in neurodegenerative and psychomotor disorders, and authored over 90 scientific publications. Beyond his scholarly endeavors, Dr. Giuffrida is actively engaged in life science and biotechnology networks in both Texas and California, fostering collaborations and knowledge exchange on a global scale. He served on the board of trustees of the Texas Research & Technology Foundation and the Texas Biomedical Research Institute. He is also a member of the "Group on Graduate Research, Education & Training" of the Association of American Medical Colleges (AAMC), and president of the Texas Scientific Italian Community.



MODERATOR



Maddalena Parafati

Ph.D., Research Assistant Professor Department of Pharmacodynamics University of Florida, College of Pharmacy

DIFFERENTIAL TRANSCRIPTOMIC PROFILING OF ENGINEERED MUSCLE TISSUE-DERIVED EXTRACELLULAR VESICLES DURING SPACEFLIGHT: IMPLICATIONS FOR UNDERSTANDING HUMAN MUSCLE AGEING

Maddalena Parafati¹ and Siobhan Malany¹

¹Department of Pharmacodynamics, University of Florida, Gainesville, FL USA

ABSTRACT

Extended stays on the International Space Station (ISS) and deep space exploration plans will challenge astronauts to counteract the muscle wasting that occurs at a faster rate than on Earth. Even with extensive daily exercise, the effects of microgravity-induced muscle atrophy are only partly reversed. Sarcopenia is the progressive loss of skeletal muscle mass and strength that occurs in older adults and shares similar hallmark features to spaceflight-induced muscle wasting, which is not fully understood, highlighting the need for tools to study the effects of microgravity on muscle function. To study in vitro aging phenotypes, we used human bioengineered skeletal muscle microphysiological systems (MPS) in an autonomous remote-controlled CubeLabTM on the ISS and on the ground. We induced contractions in young and aged-derived myobundles via electrical stimulation to mimic in vivo exercise. Exercise has been shown to mitigate age-related muscle impairment by promoting recovery and altering muscle-derived extracellular vesicle (EV) cargo. The MPS replicated functional and biochemical aspects of muscle tissue, highlighting an opportunity to investigate the effects of microgravity on muscle specific EVs population and production. We preserved space-flown tissues and serum-free conditioned media post 7-day exercisemimicking electrical stimulation for RNA and EVs isolation. Transcriptomic analysis of donor myobundles revealed age- and microgravity-related differences, with key pathways in mitochondrial and cellular stress responses and extracellular matrix degradation modified in MPS derived from young and old donors, respectively. EVs were isolated and characterized by transcriptome profiling. The results demonstrated that in vitro exercise-mimetic contractile activity of MPS affected the number of secreted EVs and the enhanced levels of the tetraspanin/CD9 marker. We aim to use cellular and EVs transcriptomics profiling to identify age- and



microgravity-related signatures. This will elucidate mechanisms of muscle aging and regeneration, predict risk factors, and develop interventions for sarcopenia on Earth and protect future space explorers.

BIOGRAPHY

Maddalena Parafati is an experienced researcher at the University of Florida College of Pharmacy skilled in space research nanomedicine, particularly focusing on 3D muscle tissues on-a-chip systems and their use in studying the effects of spaceflight on the human body, aiming to connect terrestrial life with the cosmic realm. Also, using human induced pluripotent stem cell derived (hiPSC) she developed 2D and 3D platforms to model heart and liver regeneration for disease modeling. Previously, she investigated transcriptome-level changes in muscle and hiPSC-hepatic platforms exposed to microgravity and lipotoxic insults, respectively, using RNA sequencing technology.

References:

1. Parafati M. et al. Nature PJ Microgravity. 2023; 9: 77.
2. Parafati M. et al. Medical Research Archives. 2025; 13: 4.
3. Parafati M et al. Rxiv [Preprint]. 2025 Jan 27:2025.01.26.634580. doi: 10.1101/2025.01.26.634580
4. Highlighted by ISSNl: <https://issnationallab.org/upward/upward72-uf-malany-sarcopenia/>



MULTI-OMICS PROFILING OF NEUROBLASTOMA IDENTIFIES IMMUNOLOGICAL BIOMARKERS ASSOCIATED WITH HIGHER RISK OF RELAPSE: RESULTS FROM THE MICCHADO STUDY

Antonio Colaprico

Ph.D., Translational Research Department at Institut Curie, PSL Research University, Paris, France

Authors: [Antonio Colaprico](#)^{1,2,3}, Alexandra Saint-Charles^{1,2,3}, Stelly Ballet⁴, Charles Bobin^{1,2,3}, Valery Attignon^{5,6}, Nathalie Droin⁷, Ludovic Lacroix^{7,8}, Ana Lalanne^{9,10}, Lydie Cassard¹¹, Benoit Dumont⁵, Olivier Lantz^{9,10}, Olivier Delattre^{2,3}, Nadège Corradini⁵, Claudia Pasqualini^{12,13}, Gudrun Schleiermacher^{1,2,3}

¹SiRIC RTOP, Translational Research Department, Institut Curie, PSL Research University, Paris, France.

²SIREDO Oncology Center (Care, Innovation and Research for Children and AYA with Cancer), Institut Curie, PSL Research University, Paris, France.

³INSERM U830, Laboratoire de Génétique et Biologie des Cancers, Research Center, PSL Research University, Institut Curie, Paris, France.

⁴Unité de Génétique Somatique, Department of Genetics, Institut Curie Hospital, Paris, France.

⁵Department of Pediatric Oncology, Institut d'Hématologie et d'Oncologie Pédiatrique/Centre Léon Bérard, Lyon, France.

⁶Platform of Cancer Genomics, Centre Léon Bérard, Lyon, France.

⁷AMMICA Platform, INSERM US23, CNRS UAR 3655, AMMICA, Villejuif, France.

⁸Department of Medical Biology and Pathology, Gustave Roussy, Villejuif, France.

⁹Laboratory of Clinical Immunology, Department of Diagnostic and Therapeutic Medicine, Institut Curie, Paris, France.

¹⁰Centre d'investigation Clinique en Biothérapie Gustave-Roussy Institut Curie (CIC-BT1428).

¹¹Laboratoire d'Immunomonitoring en Oncologie, Gustave Roussy, Villejuif, France.

¹²INSERM US23, CNRS UMS 3655, Gustave Roussy, Villejuif, France.

¹³INSERM U1015, Paris Saclay University, Gustave Roussy Cancer Campus, Villejuif, France.

ABSTRACT

Neuroblastoma (NB) risk stratification relies on clinical and molecular features, though few molecular markers currently inform therapeutic interventions. Leveraging multi-omics approaches, we aimed to identify biomarkers associated with relapse. For 197 NB patients (145 high-risk NB (HR-NB), 52 low/intermediate-risk) in the MICCHADO program (NCT03496402, a pancancer cohort of 600 pediatric patients), tumor and sequential blood samples were analyzed using paired tumor/germline whole exome sequencing (WES), bulk RNA sequencing, sequential plasma cell-free DNA (cfDNA), and blood flow cytometry by FACS. In HR-NB higher cfDNA and ctDNA levels were observed at diagnosis compared to non-HR. In addition to previously known genetic features, sequential cfDNA analyses identified novel alterations at relapse, including ALK, RAS-MAPK or CDKN2A/B. Transcriptomic profiling revealed a higher stemness index in HR-NB and in patients who experienced relapse, while immune deconvolution showed an increase in CD4+ memory T-cells but lower natural killer (NK) cells, suggesting a potential link between stemness, immune composition, and relapse risk. Peripheral blood flow cytometry revealed, as expected, more T-cells in younger patients and a decrease in CD3+, CD4+, CD8+ T-cells, and NK cells from diagnosis to relapse. Multi-omics profiling of NB identified novel immune biomarkers associated with relapse. A higher stemness index suggests more undifferentiated, relapse-prone tumors. Immune profiling revealed T-cell and NK cell changes, highlighting the need for integrated molecular and immune data in targeted therapies.



BIOGRAPHY

Antonio Colaprico, Eng., Ph.D., is a postdoctoral researcher in the Translational Research Department at Institut Curie, PSL Research University, Paris, France. Dr. Colaprico holds a Bachelor's and Master's degree in Telecommunication Engineering and a Ph.D. in Bioinformatics, all from the University of Sannio, Benevento, Italy. He previously worked as an associate scientist at the Sylvester Comprehensive Cancer Center, University of Miami Miller School of Medicine, Miami, USA. He develops machine learning methods for integrative analysis of cancer proteogenomics data, collaborating with international teams of interdisciplinary experts in basic and applied sciences. Dr. Colaprico has authored over 50 scientific articles, with a current h-index of 35 and 19864 citations, and a total impact factor of 1800. His research has been published as a first and co-author in high-impact journals, including Nature Communications, Nucleic Acids Research, Cell, Cancer Cell, and Immunity. His findings have been presented at major international conferences and meetings across the U.S., Europe, and beyond.



THE USE OF SOCIAL CONTACT DATA TO MONITOR BEHAVIORAL CHANGES DURING THE COVID-19 PANDEMIC

Pietro Coletti

Ph.D., Université Catholique de Louvain, Belgium



ABSTRACT

The COVID-19 pandemic initiated an unprecedented global health crisis that has profoundly transformed various aspects of human life. One of the most prominent effects was the disruption of social interactions. During the pandemic, individuals have changed their behavior, either due to Government-imposed restrictions or spontaneously, to reduce individual risk. In this presentation, I will delve into the practical application of social contact surveys for monitoring changes in population mixing during the COVID-19 pandemic, primarily focusing on the CoMix study. This comprehensive study, spanning over 20 European countries, played a pivotal role in assessing the effectiveness of various mitigation strategies. I will show results on the main determinants of social interactions during the pandemic, particularly the role of vaccination status and risk perception in modulating individuals' behavior. I will then discuss the enduring implications of the COVID-19 pandemic on social mixing and how models of infectious diseases in the years to come should account for such long-term changes.

BIOGRAPHY

Pietro Coletti is an Assistant Professor in the Faculty of Public Health and Institute of Health and Society of the Université Catholique de Louvain (UCLouvain) in Belgium. His research activity focuses on modelling infectious diseases, with a particular focus on data-informed behavioral changes and application to Influenza, RSV, Measles and COVID19. During the COVID-19 crisis, he participated in the CoMix study, which collected population responses to intervention strategies throughout Europe.



BENCHMARKING IMMUNOINFORMATIC TOOLS FOR SEQUENCE-BASED PRECISION DIAGNOSTICS OF AL AMYLOIDOSIS

Enkelejda Miho

Ph.D., Digital Life Sciences Head of the Laboratory of Artificial Intelligence for Health Group Leader Swiss Institute of Bioinformatics

Authors: Jan Kruta¹, Mario Nuvolone², Alice Nevone², Enkelejda Miho^{1,3,4*}

¹ School of Life Sciences, University of Applied Sciences and Arts Northwestern Switzerland, Muttentz, Switzerland.

² University of Pavia, Pavia, Italy.

³ Swiss Institute of Bioinformatics, Lausanne, Switzerland.

⁴ aiNET GmbH, Basel, Switzerland.

Correspondence: enkelejda.miho@fhnw.ch

ABSTRACT

Rare diseases present unique challenges in clinical diagnostics and monitoring due to their low prevalence and often severe impact on patients. A timely and precise diagnosis is critical. Next generation sequencing technologies can support precision diagnostics of amyloid light chain or primary amyloidosis (AL amyloidosis) by detecting and tracking the patient-specific immunoglobulin light chains causing AL amyloidosis. These sequences can be analyzed in the context of peripheral blood or bone marrow. Their identity and frequency provides insights on the diagnosis and minimal residual disease (MDR), the small number of cancer cells left in the body after treatment, thus informing personalized therapeutics. These immune biomarkers are essential for monitoring of disease and prediction of relapse.

A crucial step in the diagnostic process after sequencing of blood and bone marrow samples involves annotating and preprocessing raw next-generation sequences of immunoglobulin light chains. However, annotation and preprocessing of high-throughput sequencing data are not uniform across different immunoinformatics tools. These tools process data differently, leading to a variability in results. Harmonizing the output from various tools is a challenge that researchers and clinicians must address during preprocessing to ensure robustness and reproducibility of the analysis. Clinical applications related to precision diagnostics and monitoring of MDR in AL amyloidosis need to address the different output of the various immunoinformatics tools, benchmark these tools and quantify the impact of their different output on clinical insights. We have benchmarked three immunoinformatic tools IgBLAST, IMGT and MiXCR in terms of alignment and gene assignment, annotation in framework and complementarity determining regions, preprocessing intermediate results such as productive and unique sequences, sequence frequency, sequence similarity at the a.a. level measured by levenstein distance equal to 1, and sequence patterns detected by machine learning methods such as random forests and neural networks.

Our results show that (i) output differs in terms of a consistent top frequency clone detected from different immunoinformatic tools, (ii) differences in output are marked in the overall VJ sequence and in the sequence region lengths, mainly frameworks 3 and complementary determining region 3 lengths (iii) the impact of the output differences across tools depends on the type of analysis performed for the detection and monitoring of the light chain clones, with



highest impact on frequency-based analysis and lowest impact on sequence diversity architectures of entire immune repertoires and machine learning results from the detection of sequence patterns specific to AL-amyloidosis with circa 80% prediction accuracy.

BIOGRAPHY

Prof. Dr. Enkelejda Miho is a full Professor of Digital Life Sciences at the Institute of Medical Engineering and Medical Informatics, School of Life Sciences, University of Applied Sciences and Arts Northwestern Switzerland. She is a group leader at Swiss Bioinformatics Institute and head of the Laboratory of Artificial Intelligence in Health. Her research focuses on the emerging field of artificial intelligence applied to health, with a primary focus in adaptive immunity. Her group develops and applies artificial intelligence methods for (i) clinical support decision systems for precision diagnostics of infection, autoimmunity, rare diseases and cancer, and (ii) antibody discovery. She collaborates with hospitals in CH and EU to integrate different data modalities into AI-supported medical software. Prof. Miho holds a M.Sc. in Pharmaceutical Chemistry and Technology from the University of Bologna, a DAS in Pharmaceutical Medicine from the European Center of Pharmaceutical Medicine (ECPM), Faculty of Medicine, University of Basel and a Ph. D. from ETH Zurich at Biosystems Science and Engineering. She is the founder of the ETH spin-off aiNET.



EXPLOITING THE DARK GENOME TO OVERCOME CANCER THERAPY RESISTANCE

Eleonora Leucci

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ABSTRACT

Long non-coding RNAs (lncRNAs) generated from remote areas of the human genome constitute a major source of innovation for the adaptation to the numerous stresses encountered by cancer cells during progression and therapy resistance. As such, research in this field offers a unique opportunity to study cancer evolution and unveil potentially novel biology. Over the years, we have characterised several novel transcripts affecting the generation of drug-tolerant cells. These transcripts represent previously unexplored cancer specific vulnerabilities and thus extend the palette of therapeutic opportunities to include RNA based medicines.

BIOGRAPHY

Eleonora Leucci obtained her PhD in Medical Biotechnology from the University of Siena (Italy) in 2007. She then moved to BRIC, University of Copenhagen (Denmark) where she worked on small and long non-coding RNAs in the lab of Anders Lund as a postdoctoral fellow. In 2012, she moved to Belgium, where she was first a Marie Curie/VIB postdoctoral fellow in Chris Marine's lab and then an FNRS research associate at ULB, studying the role of lncRNAs in skin cancers. She is the recipient of several national and international prizes and an opinion leader in the field of lncRNA in cancer.

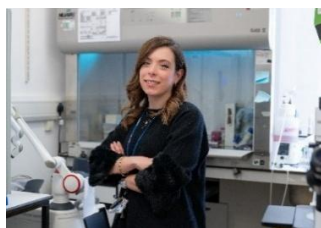
Since 2017 Eleonora Leucci leads the laboratory for RNA cancer biology and heads the PDX platform TRACE at KU Leuven. Her lab studies RNA metabolism in cancer with particular focus on the characterization of long non-coding RNAs important for therapy resistance.



UNRAVELLING NEW MODULATORS OF THERAPY RESISTANCE IN GLIOBLASTOMA

Viviana Vella

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ABSTRACT

Resistance to chemotherapy remains a major challenge in the treatment of Glioblastoma (GBM), one of the most aggressive and lethal forms of primary brain and central nervous system (CNS) tumours. Temozolomide (TMZ) is the standard treatment for GBM; however, it has led to modest improvements in patient outcomes. Protein kinases are essential regulators of cell growth and survival, playing a key role in the pathogenesis of cancer. As such, targeting protein kinases has emerged as promising therapeutic strategy in cancer treatment. While the human kinome is a valuable source of potential therapeutic targets, much of it remains unexplored. Through a comprehensive kinome-wide RNAi screen, a previously understudied protein, pantothenate kinase 4 (PANK4), emerged as a key modulator of treatment resistance. Further validation across multiple drug-resistant GBM cancer cell models, patient-derived samples, and *in vivo* studies reinforced its clinical relevance. Notably, PANK4 expression increased following TMZ treatment and correlated with poorer patient outcomes. Proteomic analysis further revealed that loss of PANK4 disrupted critical pathways involved in cellular detoxification and oxidative stress response. Specifically, under conditions of genotoxic stress, PANK4 depletion led to the accumulation of reactive oxygen species (ROS), ultimately leading to cell death. In summary, this study discusses the previously unreported role of PANK4 in therapeutic resistance, laying the foundation for further investigation into its potential as a therapeutic target.

BIOGRAPHY

Dr Viviana Vella began her academic path at the University of Ferrara (Italy), where she earned a Bachelor's degree in Medical Biotechnology, followed by a Master's degree in Molecular Biotechnology from the University of Turin (Italy). During this time, she conducted research on adrenocortical carcinoma and resistance to targeted anticancer therapies. She then moved to the University of Sussex (UK) as a Research Assistant, focusing on the tumour microenvironment in breast cancer. Dr Vella pursued her Doctoral degree at the same University, investigating the mechanisms of chemotherapy resistance in brain tumours, specifically glioblastoma. Currently holding the position of Postdoctoral Research Fellow at the University of Sussex, Dr Vella is leading multiple projects aimed at identifying therapeutic targets for glioblastoma and breast cancer, in collaboration with several international research teams. In addition to her research, she is actively involved in teaching and training university students. Dr Vella is also an editorial board member of the scientific journals *Oncogene* and *Cancer Gene Therapy* as well as a member of various scientific societies.



THE MICROBIAL AGE: CONFRONTING PATHOGENS, PROTECTING HEALTH AND FACING CLIMATE CHANGE

Antonella Fioravanti

Ph.D., Université libre de Bruxelles, Faculté des Sciences, Belgium



ABSTRACT

Microbes—the most abundant and diverse life forms on Earth—shape every aspect of our world. They are everywhere: in our bodies, in the soil, in the oceans, and in the air we breathe. Some keep us alive. Others can kill. Today, we face a critical turning point: microbes are both a growing threat and a powerful resource. Climate change, globalization, and the misuse of antibiotics are accelerating the rise of dangerous pathogens. We're seeing more infections, more resistance, and even microbes that help cancer evade the immune system. At the same time, the solutions may lie within the microbial world itself. Nature offers powerful tools—if we know how to use them. In this talk, we will review how global challenges are influencing microbes—and how microbes, in turn, are shaping our health, our ecosystems, and our future. We'll explore why we urgently need better monitoring, more basic research, and bold new strategies to fight harmful microbes. I will also share my own research using nanobodies—small, precise antibodies inspired by nature—as a novel way to target and disarm dangerous bacteria. Microbes are both the threat and the cure. Understanding them is not just scientific curiosity—it's a survival strategy for the future of humanity.

BIOGRAPHY

Professor Antonella Fioravanti is a European molecular biologist whose work is driven by a central mission: to understand and disarm pathogenic bacteria through innovative scientific approaches. Her research investigates how bacteria adapt and survive—by forming protective protein structures, developing resistance to antibiotics, interacting with cancer cells, or responding to climate-driven environmental changes. Across these diverse contexts, her goal is to develop next-generation therapeutic strategies to counter major global health threats.



She gained international recognition for her groundbreaking studies on *Bacillus anthracis*, the bacterium responsible for anthrax, demonstrating that its protein shell functions as a bacterial exoskeleton—and devising a method to dismantle it. This breakthrough, published in *Nature Microbiology* and *PNAS Nexus*, opened new therapeutic avenues against antibiotic-resistant infections.

In 2020, she became the first foreign scientist to receive the EOS Pipet Award from the Royal Academy of Sciences of Belgium as the most promising scientist of the year. She is currently a Guest Professor at the Université Libre de Bruxelles and serves as an expert evaluator for the European Innovation Council. From 2021 to 2023, she advised the Italian Embassy in Brussels on scientific cooperation. In 2023, she was appointed President of the Parsec Foundation in Prato, Italy, and was awarded the title of Knight of the Order of the Star of Italy by President Mattarella, in recognition of her scientific achievements, her commitment to advancing women in STEM, her active role in science communication, and her efforts to strengthen cooperation between Italy and Belgium.



SINGLE-NUCLEUS AND SPATIAL LANDSCAPE OF THE SUB-VENTRICULAR ZONE IN HUMAN GLIOBLASTOMA

Sara G.M Piccirillo

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ABSTRACT

The sub-ventricular zone (SVZ) is the most well-characterized neurogenic area in the mammalian brain. We previously showed that in 65% of patients with glioblastoma (GBM), the SVZ is a reservoir of cancer stem-like cells that contribute to treatment resistance and the emergence of recurrence. Here, we build a single-nucleus RNA-sequencing-based microenvironment landscape of the tumor mass and the SVZ of 15 patients and 2 histologically normal SVZ samples as controls. We identify a *ZEB1*-centered mesenchymal signature in the tumor cells of the SVZ. Moreover, the SVZ microenvironment is characterized by tumor-supportive microglia, which spatially co-exist and establish cross-talks with tumor cells. Lastly, differential gene expression analyses, predictions of ligand-receptor & incoming/outgoing interactions, and functional assays reveal that the IL-1 β /IL-1RAcP and Wnt-5a/Frizzled-3



pathways represent potential therapeutic targets in the SVZ. Our data provide insights into the biology of the SVZ in patients with GBM and identify potential targets of this microenvironment.

BIOGRAPHY

Dr. Sara G.M. Piccirillo is an Assistant Professor in the Department of Cell Biology & Physiology at the University of New Mexico (UNM) Health Sciences Center and a Full Member of the UNM Comprehensive Cancer Center.

Dr. Piccirillo graduated from the University of Milan (Italy) in Medical Biotechnology in 2003 and gained a Ph.D. in Translational and Molecular Medicine in 2008 at the University of Milan-Bicocca. For her post-doctoral training, Dr. Piccirillo was awarded a Marie Curie Intra-European Fellowship in 2010 and worked as a Research Associate in the Department of Clinical Neurosciences of Cambridge University (UK). In February 2011, she was elected as a Research Fellow of Hughes Hall, one of the 31 colleges in Cambridge. In 2013, Dr. Piccirillo started a collaboration with the University of Texas Southwestern Medical Center (UTSW) in Dallas (USA) and visited the institution between 2014 and 2016 as a Senior Scientist. In 2016, she was recruited to UTSW as a Faculty Member of Internal Medicine, and in 2018 she was promoted to Research Assistant Professor. In 2019, Dr. Piccirillo joined the University of New Mexico Health Sciences Center as a Tenure-Track Assistant Professor.

Since 2007, Dr. Piccirillo has received numerous awards and grants including the 2010 Young Investigator Award from the British Neuro-Oncology Society and Brain Tumour Research UK, the 2019 Gianni Bonadonna Prize for New Drug Development in Oncology, a 3-year Independent Investigator Research Grant from the American Association for Cancer Research and Novocure and the 2021 Translational Adult Glioma Award from The Ben and Catherine Ivy Foundation. In October 2021, Dr. Piccirillo was awarded the Robert M. Faxon Jr. Endowed Professorship in Neuro-Oncology. She has been invited to speak at several international conferences. Last September, Dr. Piccirillo was one of the Keynote Speakers at the 5th Annual Neuro-Oncology Symposium organized by the Pakistan Society of Neuro-Oncology, the Pakistan Academy of Neurological Surgery, and the Brain Tumour Foundation of Pakistan.



THE HIDDEN DRIVERS OF KIDNEY SCARRING – A NEW LOOK AT REPAIR AND INFLAMMATION

Casimiro Gerarduzzi

Ph.D., Department of Medicine, University of Montreal, Canada



ABSTRACT

Chronic Kidney disease (CKD) is a major health concern, affecting 10% of the world population. Kidney fibrosis is a maladaptive repair response that is a common pathological endpoint for all types of CKD, characterized by excessive accumulation of the extracellular matrix (ECM). In efforts to better appreciate the fibrotic matrix, we focused on a recently emerging family of unique non-structural matrix proteins called Matricellular Proteins (MCPs) due to their high expression throughout the tissue repair process. One of the many important functions of MCPs during repair is regulating inflammation and serving as a scaffold to recruit and activate immune cells. Understanding the crosstalk between MCPs and immune cells presents a unique opportunity to regulate the repair process before it becomes maladaptive, paving the way for novel antifibrotic therapies—an area where effective treatments are currently lacking.

As we explore the repair continuum using *in vivo* models of toxicant, ischemic and obstructive kidney injury, our lab is making several observations on various MCP members co-expressed during the early stages of repair, overlapping temporally with immune responses. Our *in vitro* and *in vivo* findings highlight the pivotal role these proteins play in orchestrating the formation of an immune-provisional matrix and initiating an immune-driven fibrosis through mechanisms involving neutrophil infiltration, extracellular trap formation, macrophage M1-M2 transition, and subsequent activation of fibroblasts into myofibroblasts - the effector cells of fibrosis. Genetic or pharmacological modulation of specific MCPs in experimental kidney injury and *in vitro* models significantly impeded the trajectory from acute damage to fibrotic progression. Importantly, our research demonstrates that MCPs secreted from neutrophils and epithelial cells, orchestrate critical repair and immune responses in kidney injuries, influencing fibrosis and CKD outcomes. These insights underscore the



potential of targeting the MCP-immune interface to interrupt maladaptive repair, offering promising avenues for therapeutic interventions aimed at mitigating the onset of CKD.

Our findings reveal that neutrophils play a previously unrecognized role in immune-driven kidney fibrosis by releasing MCPs that influence fibroblast activation and ECM remodeling. Furthermore, we provide novel findings behind MCP secretion by epithelial cells to influence immune cell responses to repair. Ongoing research is committed to further comprehend the detailed molecular interactions between MCPs, immune responses, and kidney repair processes, in order to identify new therapeutic strategies to prevent or attenuate CKD development.

BIOGRAPHY

Dr. Casimiro Gerarduzzi obtained his Masters and PhD from the department of Experimental Medicine at McGill University, and two separate postdoctoral fellowships completed at Harvard School of Public Health and Harvard Medical School. Dr. Gerarduzzi is currently an Associate Professor of Medicine at the University of Montreal and a researcher at the Nephrology Axis of Hôpital Maisonneuve Hospital (HMR).

His current research focuses on the molecular regulation of kidney disease progression, with an emphasis on matricellular proteins as key modulators of tissue remodeling in Acute Kidney Injury, Chronic Kidney Disease as well as Renal Cell Carcinoma. Particular research themes that his laboratory look at include those throughout the kidney disease continuum, starting from an injury-induced inflammation and senescence reprogramming that results in the initiation of repair, further progressing to its development into fibrosis. His laboratory integrates cellular systems, mouse models and human biospecimens, and applies methodologies at the interface of cellular and molecular biology and translational science in understanding kidney disease.



CHAMP1, A HIGH-RISK FACTOR FOR NEURODEVELOPMENT DISORDERS, DIRECTS THE MATURATION OF SYNAPTIC FUNCTION AND FIRING ACTIVITY IN PATIENT-DERIVED GLUTAMATERGIC NEURONS

Stefano Berto

Ph.D., Department of Neuroscience Director, Genomics and Bioinformatics Core Medical University of South Carolina, Charleston, SC, USA

ABSTRACT

Mutations in CHAMP1 are a major genetic risk factor for neurodevelopmental disorders (NDDs), as patients with CHAMP1 disorder are characterized by intellectual disability, autism spectrum disorder (ASD)-like behaviors, microcephaly, hypotonia, and dysmorphic features. CHAMP1 encodes for a zinc-finger protein involved in the maintenance of kinetochore-microtubule attachment and chromosomal segregation during mitosis, and in DNA repair mechanisms. However, the function of CHAMP1 in neurodevelopment remains relatively unexplored. We hypothesize that CHAMP1 orchestrates neuronal proliferation by modulating mitosis during prenatal development, ultimately promoting the maturation of synaptic and firing properties of excitatory neurons and synchronicity of local cortical circuits. CHAMP1 loss of function (LoF) could delay the maturation of both individual neurons and complex circuits.

To test our hypothesis, we induced neural progenitor cells (NPCs) and mature neurons using a dual-SMAD inhibition approach with one neurotypical iPSC line (Ctrl1), two patient donor lines (CHAMP1(c.1489c>T), CHAMP1(c.2094delT)), and one isogenic knockout line (iCHAMP1^{-/-}). We used nocodazole treatment to mitotically arrest the NPC proliferation. Interestingly, CHAMP1 LoF significantly reduced the number of dividing NPCs, supporting the hypothesis that CHAMP1 regulates mitosis in neural lineage cells. Next, we quantified the development of functional properties in maturing neurons by whole-cell patch-clamp electrophysiology at one and two months *in vitro*. CHAMP1(c.1489c>T), CHAMP1(c.2094delT), and iCHAMP1^{-/-} neurons exhibited altered membrane properties and reduced action potential amplitude and frequency compared to Ctrl1 neurons. Additionally, CHAMP1 LoF reduced the amplitude and frequency of spontaneous excitatory postsynaptic currents at 1 month *in vitro*. More deficits were observed in CHAMP1(c.1489c>T) neurons compared to CHAMP1(c.2094delT), which correlates with the severity of CHAMP1 syndrome present in these patients. Together these results suggest that CHAMP1 directs the maturation of excitatory synaptic and firing activity. To further explore the dose-dependent function of CHAMP1 in neurodevelopment, we will conduct western blot analysis and single-cell RNA sequencing. Future experiments will also quantify synchronous population firing using multi-electrode arrays in 2D neuronal cultures. These combined approaches will help reveal the function on CHAMP1 in human neurodevelopment.



BIOGRAPHY

University of Padova, Padova, Italy	B.S.	September 2004	Biology
University of Padova, Padova, Italy	M.S.	September 2009	Evolutionary Biology
University of Leipzig, Leipzig, Germany	Ph.D.	February 2016	Computer Science
UT Southwestern Medical Center, Dallas, TX	PostDoc	February 2021	Computational Neuroscience

As a postdoctoral fellow at UT Southwestern Medical Center under the guidance of Dr. Genevieve Konopka, I utilized next-generation sequencing techniques, including single-cell omics and whole-genome bisulfite sequencing, alongside computational methodologies. These approaches were employed to decipher the gene regulatory mechanisms underlying neuropsychiatric and neurodevelopmental disorders, and to elucidate how these intricate regulatory processes have evolved at the cellular level along the human lineage. Apart from my involvement in evolutionary medicine projects, I have also made substantial contributions to the field of imaging genomics. This involved exploring the connections between human brain activity and gene expression. Specifically, I have identified gene expression patterns correlating with human brain phenotypes observed through resting-state fMRI or EEG recordings, particularly following episodic memory tasks. Consequently, my tenure in the Konopka lab has furnished me with a diverse skill set encompassing neuropsychiatric disorders, as well as a comprehensive understanding of human genetics and genomics. The outcomes of my postdoctoral projects have been disseminated through publications in esteemed journals such as *Nature Neuroscience*, *PNAS*, *Genome Biology*, and *Nature Communications*.

My laboratory was established at MUSC in 2021. As a new and early-stage investigator, I lead a multidisciplinary research group exploring innovative directions in the study of rare diseases, with a focus on CHAMP1 syndrome, using stem cell biology, electrophysiology, and genomics. Utilizing patient-derived neurons and organoids, we investigate the electrophysiological deficits and gene regulatory mechanisms impacted by CHAMP1 loss of function (LoF) and develop RNA-based therapeutics for CHAMP1 patients. We will continue to build upon our collection of iPSC lines from individuals with CHAMP1 syndrome by collecting more participants. We will also use electrophysiology, multielectrode, and genomics data, generated in 3D and 2D cultures, to build a gene regulatory network affected by CHAMP1 mutations with the aim of better understanding allele heterogeneity as well as the complex etiology of CHAMP1 syndrome. Additionally, as a participant in the BICAN consortium, my group studies brain evolution, particularly the white matter regions. Through single-cell multiomics, we explore cell type specific gene regulatory mechanisms across multiple white matter regions. Using comparative genomics, we identify human-specific gene signatures and associate these with neurodevelopmental and neuropsychiatric disorders, such as autism spectrum disorder (ASD) and schizophrenia (SCZ).

Furthermore, I hold the position of Director of the Bioinformatics Core, where I currently oversee five bioinformaticians working on genomics of cancer and other diseases.



CHARACTERIZING SEX DIFFERENCES IN THE STROMAL AND IMMUNE MICROENVIRONMENT OF METASTATIC MELANOMA

Laura Fantini

Ph.D. Student, Prof. Neta Erez's Lab, Department of Pathology, Faculty of Medicine, Tel Aviv University

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ABSTRACT

Men have higher incidence and worse prognosis of metastatic melanoma compared to women. The underlying differences are multifactorial, including biological (e.g. hormones, metabolism, immunity) as well as behavioral factors (e.g. sun exposure, routine testing). Importantly, the tumor microenvironment (TME) plays a key role in all stages of cancer progression and metastasis, but sex disparities in the TME are largely unexplored. We hypothesize that sex-related differences in the stromal and immune microenvironment play a crucial role in metastatic relapse and therapy response. The main goal of our study is to uncover sex-specific immune and stromal mechanisms that underlie sex disparities in melanoma progression and identify therapeutic targets that can be used to enable more precise, sex-tailored immunotherapy approaches to treat metastatic disease. In this study, we utilize a mouse model of melanoma metastasis to the lungs to characterize sex-dependent differences in the TME of primary melanoma tumors and lung metastases. Our findings indicate that sex-dependent regulatory pathways affect primary tumor growth kinetics resulting in larger tumors in males. Moreover, lung metastatic burden was larger in males compared with females and the increased metastatic load was associated with higher infiltration of immune suppressive granulocytes and lower infiltration of lymphocytes. Additionally, we found that secreted factors from lung-tropic melanoma cells induced higher pro-inflammatory signaling in male lung fibroblasts compared with females. Better understanding of the underlying mechanisms of sex-dependent regulatory pathways in tumor metastasis and therapy will enable the design of sex-tailored therapeutic strategies that to combat metastasis and improve patient survival.

BIOGRAPHY

My name is Laura Fantini, originally from Treviso, currently living in Israel. I am a PhD student at **Prof. Neta Erez** Lab, Tel Aviv University. I studied Pharmacy and Industrial Pharmacy at the University of Siena, with a thesis in Toxicology supervised by **Prof. Massimo Valoti**. After completing my studies, I worked as a Clinical Data Manager at Oderzo Hospital in Treviso, collaborating with oncologist **Dr. Stefano Lamon**. Driven by curiosity, I moved to Israel to pursue my PhD and expand my knowledge in the preclinical field. My research focuses on understanding sex differences in the stromal and immune microenvironment of metastatic melanoma.



THE REVOLUTION OF EPICARDIAL ADIPOSE TISSUE IN CARDIOVASCULAR MEDICINE

Gianluca Iacobellis

MD, Ph.D., Professor of Medicine, Director of UHT Diabetes, University of Miami, Miller School of Medicine, MIAMI, FL, USA

ABSTRACT

I pioneered research on epicardial adipose tissue (EAT). The interest in EAT is rapidly growing and appealing to a broad and multidisciplinary audience. EAT is unique in its anatomy and unobstructed proximity to the heart and has a transcriptome and secretome very different from that of other fat depots. EAT has physiological and pathological properties that vary depending on its location. It can be protective for the adjacent myocardium through dynamic brown fat-like thermogenic function and harmful via local secretion of pro-inflammatory and profibrotic adipokines. EAT is a modifiable risk factor that can be clinically assessed with traditional, like ultrasound that we first invented, and novel imaging techniques. Coronary and left atrial EAT are involved in the pathogenesis of coronary artery disease and atrial fibrillation, respectively, and it also contributes to the development of heart failure. EAT is a reliable and modifiable therapeutic target for drugs with cardiovascular benefits such as glucagon-like peptide 1 receptor agonists (GLP-1As) and sodium-glucose co-transporter 2 inhibitors (SGLT2is). The recently emerged cardiovascular beneficial effects of GLP-1As can be mediated by the activation and modulation of EAT GLP-1 receptors, as recently discovered by our group. The translational nature of the EAT research is shifting traditional paradigms in the physiopathology and treatment of major cardiovascular diseases.

BIOGRAPHY

Prof Gianluca Iacobellis is full professor of Medicine, Director of UHealth Tower Diabetes and vice-chair of IRB, University of Miami Miller School of Medicine. A native of Rome, Italy, Prof Iacobellis received his MD degree cum laude in 1994 from the University of Roma, La Sapienza; Research Fellow at the Centrum for Metabolism & Endocrinology, Karolinska University, Stockholm, Sweden in 1999; Specialist in Endocrinology in 2000 and PhD in Endocrinology, Metabolic and Cardiovascular Disorders in 2004. Invited Post-doctoral Clinical Research Fellow, Center for Human Nutrition, South-Western Medical Center, University of Texas, Dallas, USA in 2004, Clinical Research Fellow, Cardiovascular Obesity Research & Management, McMaster University, Hamilton, Ontario in 2005; Associate Professor of Endocrinology at McMaster University in 2006; Associate Professor of Medicine, Division of Endocrinology, and Director of the ACC Diabetes Clinic at Jackson Memorial Hospital, University of Miami, FL, USA in 2010; Professor of Medicine and Director of the University of Miami Hospital Diabetes Service since 2013.

Prof Iacobellis is considered the world leading expert in EAT. He has authored 165 scientific articles and 11 textbooks with a current h index of 64 and more than 18000 citations. He has published in top-ranked journals such as Nature Endocrinology, Nature Cardiology, JAMA, JAMA Cardiology, JACC, Trends in Endocrinology and Metabolism, European Heart Journal. He is co-principal investigator of several NIH funded R01 clinical trials on the role of epicardial fat in coronary artery disease and atrial fibrillation.



ASSESSMENT OF CANNABIDIOL SUPPLEMENTATION IN GROWING RABBITS: EFFECTS ON BEHAVIORAL PATTERNS

Valeria Iervolino

Ph.D., Student in Veterinary Sciences at the Department of Veterinary Medicine and Animal Production of the University of Naples Federico II

Valeria Iervolino (1), Daria Lotito (1), Consiglia Longobardi (1), Pietro Lombardi (1), Sara Damiano (1).*

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ABSTRACT

The present study aimed to evaluate the effects of dietary cannabidiol (CBD) on behavioral patterns in rabbits. A total of 42 New Zealand x White California rabbits (60 days, sex ratio 1:1, average weight 1621.3 ± 46.2 g), were allocated into 2 groups (21 animals/group), and individually housed. Both groups were fed the same commercial diet, but the CBD one was supplemented with 0.1 ml of a cannabis extract in coconut-based oil corresponding to 10 mg of CBD/animal/day. CBD extract was characterized according to the European Pharmacopoeia. Video recordings lasting 90 minutes each were conducted once a week for 4 weeks. The recordings were coded by 2 expert observers, with an interobserver reliability of 90-96%. During the initial phase of the trial, treated rabbits demonstrated a significant increase in locomotor activities ($p = 0.0192$). By the end of the trial, treated rabbits exhibited a significant increase in grooming behavior compared to the control group ($p = 0.0498$). %. In terms of resting behavior, control group spent more time lying down than CBD group, although this difference did not achieve statistical significance ($p = 0.0850$). Overall, behavioral analyses revealed significant changes in CBD-treated rabbits in terms of generalized increases in locomotor activity and grooming behaviors. Although less evident, CBD group tended to show more pronounced "movement" behavior. Confirmation that CBD-treated rabbits spent significantly more time grooming than the control group was given at the end of the experiment. "Stretching" also increased significantly in CBD-treated rabbits, which could be associated with changes in muscle tone or comfort. Such behavioral changes could be interpreted as an improvement in psychological well-being, probably associated with the anxiolytic action of CBD (1). Overall, the data suggest that CBD significantly affects behavioral changes, proving a possible welfare improvement. Further studies are necessary to fully understand the mechanisms behind these effects in order to improve welfare and psychological state of animals, particularly important in intensive farming where animals are subjected to continuous stress.

References

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BIOGRAPHY

Since 2024, Valeria Iervolino has been a PhD student in Veterinary Sciences at the Department of Veterinary Medicine and Animal Production of the University of Naples Federico II. She holds a Master's Degree in Precision Livestock Farming LM-86 (University of Naples Federico II, 2023). Her main research focuses on the use of natural extracts and their pharmacophysiological and ethological effects in different animal species.



EFFECTIVENESS OF A DIETARY SUPPLEMENT MIX IN MODULATING INFLAMMATION AND OXIDATIVE STRESS MARKERS IN OLD DOGS

Consiglia Longobardi

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Consiglia Longobardi (1), Valeria Iervolino (1), Arianna Delle Ville (1), Francesco Ferrucci (1), Roberto Ciarcia (1), Sara Damiano (1).

ABSTRACT

Aging in dogs is a complex process characterized by metabolic, immunological and neurological changes that can lead to chronic inflammation and oxidative stress. These factors contribute to cellular degeneration and the onset of age-related pathologies, such as osteoarthritis, cognitive decline and metabolic dysfunctions [1]. The use of phytotherapeutics with antioxidant and anti-inflammatory properties represents a promising approach to improve the quality of life in elderly dogs.

The aim of this study was to investigate the beneficial effect of a mix of phytoextracts on geriatric dogs ($n=7$; weighing 50-80 Kg; 8-10 years old). In particular, the mix was constituted by *Passiflora* (10 mg/Kg b.w), *Whitania somnifera* (10 mg/Kg b.w) and *Taraxacum officinale* (15 mg/Kg b.w.) administered per os for 40 days in addition to their diet. The whole blood and serum have been collected at the beginning of the experimental phase (T0), after 20 days (T1) and at the end point of the experiment, i.e., 40 days (T2), and used for biochemical analysis, detection of interleukins by ELISA, and for malondialdehyde (MDA) and Total antioxidant capacity (TAC) assay.

Results revealed that C-reactive protein (CRP) before treatment (T0) was significantly higher than T1 and T2 ($p < 0.01$ and $p < 0.001$). Moreover, a decrease in IL-6 and IL-10 cytokines at both T1 ($p < 0.05$) and T2 (0.01) was observed, probably due to mitigation of chronic inflammation in the treated geriatric dogs. The addition into the diet of the abovementioned extracts promoted TAC and reduces lipid peroxidation in the sera of aged dogs, especially at T2 ($p < 0.001$). Interestingly, liver parameters (ALT, ASP, Lipase), that resulted altered at T0, returned within physiological range at the endpoint of the treatment.

The integration of these herbal medicines into dietary or therapeutic regimens could improve the quality of life, promoting the general well-being of old dogs.

[1] Cohen et al. Aging across the tree of life: The importance of a comparative perspective for the use of animal models in aging. *Biochim Biophys Acta Mol Basis Dis*, 2018.



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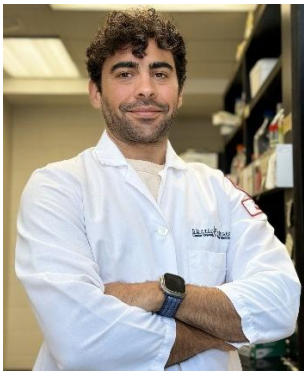
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THE PERFORM STUDY: AI VS. HUMAN RESIDENTS IN CROSS-LANGUAGE OBSTETRICS-GYNECOLOGY SCENARIOS

Canio Martinelli

MD, MS, Ph.D. Student



ABSTRACT

Artificial intelligence (AI) is critical in healthcare since its application can transform “Big Data problem” in reliable source to reshape decision-making in women’s health, yet few studies have rigorously compared AI-driven large language models (LLMs) to human practitioners under real-world conditions. In the PERFORM Study, we conducted a cross-sectional evaluation of eight LLMs and 24 obstetrics-gynecology (OB-GYN) residents, testing them on 60 standardized clinical scenarios in both English and Italian and in time constraints. Our findings showed that top-performing AI models achieved higher overall diagnostic accuracy than residents (up to 90% vs. 65%) and maintained consistent performance across languages and time constraints. However, mid- to lower-tier LLMs exhibited greater variability, underscoring the importance of model selection and quality control. We also observed that while first- and second-year residents benefited substantially from AI support, advanced trainees experienced diminishing returns and, in some cases, risked overreliance on AI outputs. We wanted to analyze error patterns and see how AI’s strengths can complement human expertise. These results suggest that AI can serve as a valuable educational resource for junior clinicians, helping them build confidence and refine diagnostic reasoning skills. For seasoned physicians, AI may provide supportive “second opinions,” but careful implementation is critical to prevent complacency and maintain clinical autonomy. By illuminating how language proficiency, time constraints, and user experience affect performance, the PERFORM Study offers a nuanced framework for incorporating AI in OB-GYN care.

BIOGRAPHY

Dr. Canio Martinelli is an OB/GYN, leading woman’s health research and innovation at Sbarro Health Research Organization, at Temple University in Philadelphia. He is also a FDA-AACR fellow, a MSc in drug



development and a Ph.D. candidate in Translational Molecular Medicine and Surgery at the University of Messina. He has contributed to numerous clinical and research initiatives, focusing on gynecologic oncology, minimally invasive surgery, and AI-driven solutions for patient care. With a background that spans international collaborations and advanced academic training, Dr. Martinelli aims to integrate state-of-the-art technology with compassionate clinical practice to improve outcomes and education in women's health.



OPTIMIZATION OF A MICROFLUIDIC DEVICE FOR THE CONFORMAL ENCAPSULATION OF PANCREATIC ISLETS IN TYPE 1 DIABETES

Helena Montuoro

ABSTRACT

Type 1 Diabetes (T1D) is a chronic autoimmune disease characterized by the dysfunction or destruction of pancreatic beta-cells, leading to insulin deficiency and, consequently, an altered control of blood glucose concentration (glycemia). Traditionally, the primary goal has been the management of T1D through the intensive injection of exogenous insulin, but innovative therapies are now offering the possibility of a cure. Among the most promising approaches, islet transplantation allows for a minimally invasive procedure, but it requires lifelong systemic immunosuppressive therapy to prevent rejection. To address these challenges, a potential strategy is the conformal coating encapsulation of single pancreatic islets within a selectively permeable membrane that conforms to their shape and size, resulting in a thin and uniform coating capable of protecting transplanted cells from immune attack while maintaining their physiological function. This study focuses on the optimization of a soft lithographic microfluidic device to achieve conformal encapsulation of pancreatic islets using a polyethylene glycol (PEG)-based hydrogel. The device was tested under different conditions, and various assays were performed to assess both the viability and functionality of encapsulated cells, as well as the integrity of the PEG shell. In vitro experiments demonstrated the formation of a thin coating around Nit-1 clusters and human islets, the two cellular models used. Notably, encapsulated human islets exhibited enhanced glucose-stimulated insulin release compared to controls, highlighting the potential of this approach.

BIOGRAPHY

My name is Helena Montuoro. I was born on May 15th, 2001, in Catanzaro (CZ, Italy). I graduated in 2025 with a master's degree in biomedical engineering from Politecnico di Milano (Italy). From August 2024 to March 2025, I conducted my master's thesis at the Diabetes Research Institute in Miami (FL, USA) under the supervision of Dr. Alice Tomei.



NANOTECHNOLOGY-BASED IMMUNOTHERAPY: DRUG DELIVERY AND POLYMERIC NANOPARTICLES FOR IMMUNE REGULATION IN CELL AND TISSUE TRANSPLANTATION

Giulio Palummieri

ABSTRACT

Pancreatic islet transplantation represents a promising therapeutic alternative for type 1 diabetes (T1D), but its clinical success is limited by donor scarcity and the need for chronic immunosuppression. Nanomaterial-based localized drug delivery offers a strategy to enhance graft survival while minimizing systemic side effects. Drug-Integrating Amphiphilic Nano-Assemblies (DIANAs), a self-assembling polymeric nanoparticle system, for controlled and targeted anti-inflammatory and immunosuppressive drugs release. These nanostructures, formed from poly(ethylene glycol)-poly(propylene sulfide) (PEG-PPS) or poly(ethylene glycol)-oligo(ethylene sulfide) (PEG-OES) copolymers, self-assemble into nanomicelles (nMIC) and nanofibrils (nFIB). They effectively encapsulate hydrophobic drugs such as cyclosporine A (CsA), Rapamycin (Rapa), and Dexamethasone-Palmitate (DexP), enabling sustained drug release for up to two weeks, targeted immune cell uptake, and controlled biodistribution. The therapeutic potential of DIANAs is demonstrated through two key applications: (i) nMIC-mediated delivery of DexP, which reduces IL-6 secretion in macrophages and prolongs graft survival in an allogeneic mouse skin transplant model, and (ii) the internalization of Rapa-loaded nFIB into Mesenchymal Stem Cells (MSCs), enhancing their immunomodulatory effects. nFIB-containing MSCs (MSC-nFIB) effectively cluster around human pancreatic islets, suggesting direct cellular interaction and localized immunoprotection. In preclinical models of T1D, co-transplantation of allogeneic pancreatic islets with MSC-nFIB resulted in prolonged graft survival and improved glucose homeostasis respect to control treatments. Additionally, in vivo biodistribution analysis revealed that intraperitoneal (IP) injection of MSC-nFIB leads to their preferential accumulation in the pancreas, highlighting a novel and promising strategy for targeted auto-immune protection of pancreatic islet in diabetes prevention. The findings suggest that DIANAs represent an ideal platform for the development of localized immunosuppression and anti-inflammatory (LISAI) therapies, with potential applications in pancreatic islet transplantation and other conditions that benefit of localized drug delivery.

BIOGRAPHY

My name is Giulio Palummieri. I was born on September 2nd, 2000, in Busto Arsizio (VA, Italy). I graduated in 2025 with a master's degree in biomedical engineering from Politecnico di Milano (Italy). Currently, I am a Research Associate I at the Diabetes Research Institute in Miami (FL, USA), working in Dr. Diana Velluto's laboratory.



HUMANITIES



MODERATOR

Pasquale Nardone

Ph.D., Département de Physique Laboratoire d'information quantique Université libre de Bruxelles, Belgium

Born in Italy in 1956. I study Physics at “Université Libre de Bruxelles”. I got my PhD in 1983 under François Englert and Robert Brout direction on Quantum Field Theory in Curved Space-Time. I specialize in quantum field theory and general relativity. After some PostDoc (Paris, Konstanz) and some research in radar detection for the CEE I receive a full position in 1994 at “Université Libre de Bruxelles” until 2021 when I retired.



AI-ASSISTED SPIRITUALITY: TRANSFORMING THE IGNATIAN EXERCISES AND THE LECTIO DIVINA FOR MODERN LEADERSHIP DEVELOPMENT

Michele Vincenti

Ph.D., Associate Dean Graduate Programs, University Canada West Vancouver, Canada



ABSTRACT

Motivation

Over the centuries, the Saint Ignatius Spiritual Exercises and the Lectio Divina have proven to be tools to raise self-awareness, leadership development, and ethical discernment, which are critical in leadership. A human spiritual guide has always been an essential part of spirituality. However, due to the shortage of trained spiritual guides that limit the accessibility of these transformative practices, the development of artificial intelligence (AI) has shown the potential to fill the gap and act as a spiritual guide.

Problem Statement

Spirituality requires personalized and empathetic feedback that AI may not have, posing the question of whether artificial intelligence can adequately provide human guidance and, at the same time, keep the authenticity and effectiveness of these practices. Privacy and ethical concerns using an AI-driven spirituality system require serious consideration.

Approach

The paper uses an autoethnographic method, documenting the author's personal experience completing the Spiritual Exercises and the Mark's Gospel Lectio Divina with ChatGPT as a spiritual guide. Autoethnography is a qualitative research method that combines personal narrative and the study of cultural experience. The daily journals captured the reflections and interactions using AI. Thematic and error analysis evaluated AI's performance against critical variables such as communication style, emotional depth, ethical guidance, comfort, and reduced inhibition with AI.

Findings

AI successfully facilitated and structured the exercises, encouraged routine, and reduced inhibition because of the non-judgmental nature of AI. ChatGPT lacked moral accountability and empathy, as the feedback errors in overlooking emotional nuance show even if it tries to show some empathy. Three themes emerged: daily spiritual life, struggle with imperfection and faith as a personal anchor.



Implications

AI-driven spirituality can complement human guidance, particularly in leadership training programs, by encouraging self-reflection and ethical decision-making skills that are important in a leader. However, the human mentor remains essential. What the technology can do is provide support for daily reflections and journaling, but a human spiritual guide remains a must for in-depth discussions or complex spiritual dilemmas. A closed-loop AI system is recommended to improve privacy and mitigate ethical risks.

Keywords: AI-assisted spirituality, Ignatian Spiritual Exercises, ethical decision-making, autoethnography.

BIOGRAPHY

Dr. Michele Vincenti's distinguished academic and professional journey showcases his profound organizational development, leadership, and management consulting expertise. His experience spans various international institutions, marked by significant teaching, research, and professional practice achievements. His contributions to both academia and industry, coupled with his commitment to mentorship and community involvement, underscore his exceptional credentials, making him a notable figure in his field.

Academic Credentials:

Dr. Vincenti holds a Ph.D. in Organizational Development Systems from Fielding University, with a concentration in Transformative Learning for Social Justice, and an M.A. in the same field. He also possesses an MBA in Consulting from Royal Roads University. His dissertation, titled "Emotions and Innovative Leadership: An Interpretative Phenomenological Analysis," was supervised by Dr. Katrina Rogers.

He has been a Full Professor and Associate Dean of the University of Canada West Graduate Programs, with additional appointments at Simon Fraser University.

Dr. Vincenti has a substantial record of academic employment and teaching roles at various esteemed institutions worldwide, including Aspen University, Fairleigh Dickinson University, Royal Roads University, Swiss Management Center, Grenoble Ecole de Management, University of Phoenix, and London School of Business and Finance.

His teaching accolades include being a finalist for the Kelly Award at Royal Roads University and winning a Teaching Award at University Canada West in 2021.

Professional Achievements:

Dr. Vincenti is President and CEO of Alvana Business Consulting Inc, providing innovative business solutions internationally since 2003. He also heads Holon Consulting Inc, assisting companies with financial analysis, stock exchange listing, and process restructuring.

A deep understanding of international operations, cultural diversity, and organizational change marks his expertise. He is recognized for his ability to drive successful business turnarounds, launch impactful projects, and build profitable operations. His management style emphasizes empowering team members and fostering individual ownership.

He has been involved in various mentorship and community roles, including mentoring young entrepreneurs with Futurpreneur Canada, serving on the Board of Governors at Columbia Academy, and engaging in educational programs with Junior Achievement of British Columbia and the Immigrant Employment Council of BC.



THE “MENS SANA” PROJECT

Eugenia Cenini

MS Researcher Pedagogical Sciences, University of Espírito Santo, Brazil



ABSTRACT

The "Mens Sana" project aims to assess physical and psychological well-being and quality of life through an integrated approach that includes physical, psychological, and molecular health parameters. Key objectives include evaluating stress, sleep, pain, and cardiovascular conditions, as well as implementing educational and preventive interventions. The Epigene research group at the Federal University of Espírito Santo, which specializes in the epigenetic analysis of the NR3C1 and BDNF genes, plays a crucial role in studying the effects of stress and trauma on gene regulation. The project builds on prior experiences with public security officers and substance use prevention and aims to enhance the effectiveness of interventions through the use of advanced epigenetic markers.

BIOGRAPHY

My name is Eugenia Cenini, and I was born on October 14, 2001, in Bologna, Italy. I hold a Master's degree in Pedagogical Sciences, with a specialization in Youth at Risk, from the University of Amsterdam (Netherlands, 2023), and a Bachelor's degree in Psychological and Educational Sciences from the Université Catholique de Louvain (Belgium, 2022). During the academic year 2021–2022, I also participated in the Erasmus programme at the University of Coimbra (Portugal). Throughout my academic training, I have developed a strong theoretical foundation in the psychological and educational challenges affecting children and adolescents. This expertise has fostered a deep commitment to advancing preventive strategies against child abuse and promoting psychosocial education for youth. To complement my academic background, I have been actively involved in several volunteer initiatives targeting vulnerable children: I facilitated creative and educational activities for refugee children in Brussels, participated in a community development project in Cambodia, and am currently serving as an educator at CAOCA (House of Care and Guidance for Children and Adolescents) in Vitória, Brazil. These international experiences have enriched my



intercultural competencies and broadened my understanding of the diverse social challenges faced by children across different settings. During my Master's programme, I contributed to the conceptualization of an anti-bullying intervention tailored for public secondary schools that often report elevated rates of physical, verbal, and psychological aggression. The project, which examines the impact of cultural and educational contexts on youth identity formation, aims to support the development of educational and social policies, and to reinforce programmes that integrate mental health and social development. Most recently, I completed an internship at the European Parliament in Brussels, where I was primarily involved in communication and public relations activities. Following this experience, I was approved by Professor Adriana Madeira Alvares da Silva to collaborate on a postgraduate extension project within the Department of Morphology at the Federal University of Espírito Santo, as part of the "Mens Sana" initiative.



HARNESSING THE FUTURE: AI IN THE ITALIAN LANGUAGE CLASSROOM

Moira Di Mauro-Jackson

Ph.D., Italian Division Coordinator, World Languages and Literatures, Texas State University, Texas

ABSTRACT

My research explores the transformative role of generative AI in higher education, in particular in the Italian classroom. As technology rapidly evolves, educators must adapt to its potential for personalized learning, content creation, and real-time feedback. This session will delve into practical applications of AI tools in the classroom, the ethical considerations surrounding AI use, and strategies for integrating AI into our university curricula. Attendees will gain insights into fostering an environment where both students and instructors can thrive amid this technological shift, while ensuring that academic integrity and critical thinking remain central to the learning process.

BIOGRAPHY

Dr. Di Mauro-Jackson received her PhD from the University of Texas at Austin in Comparative Literature. Her field of study revolves around French, Italian, and English Narrative and Drama of the late 19th and early 20th Centuries. Her field of interest is meta-textuality, that is the tension between art and life, art and artifice, and the use of masks and masquerade in modern works. Since 1987, Moira, a native Italian, has been teaching French, and then Italian, at Texas State University in San Marcos, from where she received a Master of Arts. In 2005, Moira introduced the Italian Language Program at Texas State University and directs a Summer Abroad Program to Italy every summer, now teaching both French and Italian in the World Languages and Literatures Department. In 2020, Moira was nominated for the Presidential Distinction Award in Teaching and received the Liberal Arts Golden Apple Award in Teaching (2020) and Service (2024). Her paper entitled “D’Annunzio’s *Il piacere*: A Generational Gaze on New Values,” has recently appeared in *Forum Italicum: A Journal of Italian Studies*, Stony Brook University, NY, USA (April 2017). Dr. Di Mauro-Jackson creatively integrates Artificial Intelligence (AI) into her language and cultural courses to enhance both teaching and learning experiences. In her discipline, AI serves as a powerful tool to supplement traditional language instruction by offering personalized learning opportunities for students. One key way she uses AI is through language learning platforms powered by AI algorithms. These platforms can assess individual students’ proficiency levels, adapt lessons based on their strengths and weaknesses, and provide immediate feedback on pronunciation, grammar, and vocabulary use. This personalized approach ensures that students progress at their own pace while receiving tailored support. In addition to AI-driven learning tools, Dr. Di Mauro-Jackson leverages AI-based translation tools to help students understand complex texts in French and Italian. However, she emphasizes critical thinking by encouraging students to critically evaluate machine-generated translations, ensuring that they grasp the nuances of both the source and target languages. This approach helps students recognize the limitations of AI and fosters their ability to engage in more nuanced, human-driven translation work. Furthermore, Dr. Di Mauro-Jackson employs AI in content creation for her courses. For instance, she uses generative AI tools to help design interactive exercises, quizzes, and authentic cultural content that can reflect current events or new literary works, bringing modern, real-world elements into her curriculum. Lastly, Dr. Di Mauro-Jackson encourages students to engage with AI-based tutoring and writing assistants



to refine their language skills, especially for writing assignments. These tools provide immediate feedback on grammar, syntax, and style, but the professor also incorporates discussions on the ethical use of AI in academic work, ensuring students understand the importance of maintaining academic integrity. Overall, Dr. Di Mauro-Jackson's approach to using AI in her French and Italian courses is one that blends technology with traditional pedagogical methods, ensuring that her students not only acquire language skills but also develop critical thinking and ethical literacy in the digital age. Dr. Di Mauro-Jackson is particularly known for her work in the field of Italian pedagogy, helping students understand both the language and cultural contexts of Italy. She is often involved in creating educational content and materials for beginning and intermediate-level Italian students, and has contributed to the development of textbooks and courses that bridge the study of language with the exploration of Italy's rich cultural and historical heritage. If you're using materials from Dr. Di Mauro-Jackson, especially in the context of Italian language learning, you may be studying Italian through a structured approach that emphasizes language acquisition alongside an understanding of Italian history, society, and arts. (<https://www.liberalarts.txstate.edu/faculty/honors-awards/Faculty-Awards-2020>)



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