



FALLING WALLS LAB

Friday, September 27th
02:00 p.m. (BRT)

BRAZIL



Federal Foreign Office



CONCEPT

The Falling Walls Foundation founded Falling Walls Lab in 2011 to:

CONNECT aspiring innovators

DISCOVER and develop talents

SUPPORT interdisciplinary dialogue and international cooperation

DEVELOP new ways of scientific communication

BUILD new and strong networks

TIMELINE

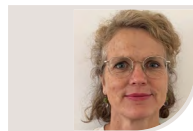
- 02:00 p.m. Welcome and introductory remarks
- 02:25 p.m. Pitches (1 - 7)
- 03:00 p.m. Break
- 03:10 p.m. Pitches (8 - 15)
- 04:00 p.m. Jury session / Brief presentations of german institutions
- 04:40 p.m. Awards ceremony / Group picture
- 05:00 p.m. Farewell reception

PRE-JURY

Márcio Weichert
Head of Programme-
DWIH São Paulo



Nina von Sartori
Scientific Counsellor-
German Embassy in
Brasilia



Sören Metz
Liaison Officer-TUM



Msc. Sylvia Affonso
Biologist-UFABC





Anamaria Nascimento

Communications Coordinator - Da Fonte Advogados

Anamaria Nascimento is Communications Coordinator at Da Fonte Advogados. From 2011 to 2021, she worked at *Diário de Pernambuco*, serving as Education reporter. She has received over 20 journalism awards and participated in international programs, such as "Study and research in Germany 2017", from German Federal Foreign Office. In 2021, she was recognized as a Journalist Friend of Children by ANDI.



Prof. Dr. Fernando Hallwas

Full Professor - Federal University of Pernambuco (UFPE)

Fernando Hallwas is a chemist, graduated in Industrial Chemistry (UFSM/RS), had a master's degree in chemistry (UFSC/SC) and a doctorate at UFPE/PE. Currently, he is full professor in the Department of Fundamental Chemistry at UFPE. His research interest is focused on Nuclear Magnetic Resonance spectroscopy applied to the structural elucidation of organic molecules.



Prof. Dr. Fernando Buarque

AI-head - University of Pernambuco

Fernando Buarque is PhD in AI (Imperial College London), Alexander von Humboldt Fellow, Senior Member IEEE, Senior Associate Professor and AI-head at the University of Pernambuco-Brazil, supervised 120 students, and authored 240 scientific publications. His current research tackles complex decision problems, via rational/explainable evolutionary and social modelling/simulations, aiming at flourishing societies for us, 'planetizens'.



Isabelle Lemos

Founder and CEO - D.ia.nteira

Isabelle Lemos is the founder and CEO of D.ia.nteira, an early-stage Artificial Intelligence (AI) startup focused on Business applications. She is a lawyer, Business and Innovation Consultant, and Speaker. Currently pursuing a master's degree in Design at CESAR School, she holds a specialization in Law and Technology and a bachelor's degree in Law from UFPE. With an interdisciplinary academic background and professional experience, she previously served as the Product Lead for Entrepreneurship at Porto Digital, where she coordinated and executed over 10 Entrepreneurship Programs, supporting more than 245 startups and businesses.



Prof. Dr. Maria do Carmo Sobral

Professor, Civil Engineering – Federal University of Pernambuco (UFPE)

Maria do Carmo Sobral is Civil Engineering at Federal University of Pernambuco (UFPE). PhD in Environmental Planning at Technical University of Berlin, Visiting research at Institute for Water Education- UNESCO-IHE, Holland. Member of National Academy of Engineering; Pernambuco's Academy of Engineering Pernambuco's Academy of Engineering. Collaborating Researcher at Institute of Advanced Studies IEA/USP. Representative of Northeast Region at REBRALINT (Brazilian-Germany netz for promoting the internalization of graduation programs). Full professor at Department of Civil and Environmental Engineering at UFPE, working in the field of environmental planning and technology, integrated management of river basins and objectives of sustainable development.



Prof. Dr. Rafael Melo

Senior Researcher – Cesar School

Rafael Ferreira Mello holds a Ph.D. in computer science and is a professor at UFRPE and senior researcher at CESAR. He coordinates the master's and Ph.D. programs at CESAR School and leads national projects funded by the Ministry of Education, focusing on natural language processing and learning analytics. He has supported the adoption of Learning Analytics in Brazil and collaborated on multinational projects across Europe, Australia, and Latin America. Dr. Mello is widely published and serves as an editor and reviewer for top journals and conferences in his field.



Paulo Sales

Chairman of the Board of Directors of Rede Moura

Mechanical engineer by training, with an executive specialization in the Advanced Management Program (PGA) from INSEAD (Institut Européen d'Administration des Affaires) in France, businessman Paulo Sales is part of the second generation of the Moura Family – shareholders of Grupo Moura, the market leader in batteries in South America. With a career marked by significant achievements, he holds strategic positions in entities and organizations of high relevance for the socio-economic development of Pernambuco and the Northeast. In addition to being Chairman of the Board of Directors of Rede Moura, he also serves as Chairman of the Boards of Amcham Recife, Junior Achievement Pernambuco, and the Board of Directors of the Suape Industrial Port Complex. He is also one of the founders of the Atitude Pernambuco movement, a think tank formed by entrepreneurs and executives from various sectors in the state of Pernambuco.

1 – Breaking the Wall of Green Hydrogen Production

Santino de Melo, Federal University of Ceará

Problem: The project addresses environmental issues from improperly disposed shrimp shells, which are hard to decompose. It aims to develop a proton exchange membrane using chitosan from these shells, doped with nanocellulose and graphene oxide, optimizing efficiency and evaluating commercial viability.

Solution: The proposed solution is to transform shrimp shells into a proton exchange membrane from chitosan for the production of green hydrogen. The project includes experimental tests and computer simulations to optimize the efficiency of the membrane and evaluate its commercial viability.

Project: This project contributes to the advancement of green hydrogen technology and shrimp shell recycling. The combination of experimental tests and computer simulations will provide an in-depth understanding of the membrane's characteristics, facilitating its production and attracting investment.

2 – Breaking the Wall of Chronic Wounds Therapy

Bruna Carvalho, University of Campinas

Problem: According to the study "Diabetic Foot Ulcers and Their Recurrence," published in 2017 by The New England Journal of Medicine, the annual worldwide incidence of diabetic ulcers, which are non-healing wounds that disrupt the skin with an extended healing process, is between 9 to 26 million.

Solution: Combining tissue engineering and gene delivery offers a promising alternative treatment for non-healing wounds. Gene-activated biomaterials can offer temporal and spatial release control of nucleic acids encoding relevant therapeutic growth factors that ensure effective tissue growth.

Project: Development of gene-activated granular biomaterials for non-healing wounds. These materials provide controlled release of messenger RNA (mRNA)- loaded lipid nanoparticles while supporting tissue regeneration.

3-Breaking the Wall of learning sign languages

Caio Costa Quintana, Sign Link

Problem: The lack of integration between sign languages and the restriction of learning materials to national spoken languages create barriers that hinder learning one sign language from another. Our goal is to enhance international mobility for deaf students by providing a pathway to their autonomy.

Solution: Our app empowers deaf students by offering sign language proficiency assessments, certificates for university access, curated learning materials, a community-driven dictionary, and global connections. Engage in international matchmaking, join a global community, and explore study opportunities.

Project: Sign Link supports deaf students by assessing sign language proficiency, offering certificates for university access, and providing curated learning materials with a community-driven dictionary. It also enables global connections, international matchmaking, and access to study and work opportunities.

4-Breaking the Wall of solar energy

Maria Claudia Botan, State University of São Paulo

Problem: Solar panels have a limited util life, around 25 years. After this the panels become a difficult material to recycling. This is a problem, because something used to promote a sustainable energy can be a big environmental problem.

Solution: The solution promote a recovering os the panels with syntetic diamond. The syntetic diamond have to be doped to assume semiconductor characteristics. On this way the panels are recovered and are recycled.

Project: Solar painels have a limites util life, around 25 years, after this they become a environmental problem. The painels can be recovered with syntetis diamond, with semiconductor characteristics, and the painels are recycled.

5-Breaking the Wall of lack of social engagement

Igor Lins, EMPREL-Public IT company in Recife

Problem: The population's low participation in actions to promote physical and mental health, in addition to insufficient engagement in citizenship actions, such as blood donation, selective collection and other activities that contribute to individual and collective development.

Solution: A gamification strategy to encourage the population's participation in social welfare actions, such as public gyms, which promote a healthier and more sustainable city. This strategy uses the Capiba digital currency, a new feature on the Recife City Council's service platform.

Project: The project consists of implementing the Capiba social and digital currency, a gamification strategy that encourages citizen participation through digital rewards such as prizes and products, integrated into the Recife City Council's service application, Conecta Recife.

6-Breaking the Wall Of Inclusive Cell Biology

Bianka da Silva Rauber, Federal University of Rio Grande do Sul

Problem: How to produce teaching materials for Cellular Biology that are suitable for students with and without disabilities (especially visual disabilities) and that are resistant to handling?

Solution: To produce objects through Digital Manufacturing (3D printing and Laser cutting) that enable haptic experiences, integrating the concrete and abstract dimensions of learning for both people with and without disabilities.

Project: We develop/produce, through digital manufacturing, educational models of cells and subcellular structures to make the teaching of Cellular Biology more inclusive for students with and without disabilities. We transform microscopic structures into interactive learning objects and accessible for all.

7-Breaking the Wall of Use of Mining Waste

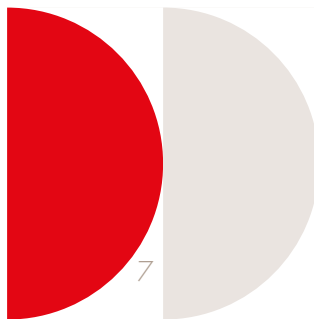
Hélio Silva, Instituto de graduação e pós graduação de Goiás

Problem: There is an urgent need to give a more noble destination to waste from iron and emerald mining activities, in addition to polymeric waste from polyester fabrics and post-consumer PET bottles and their application in the production of ecological bricks intended for the construction of social housing.

Solution: Iron and emerald mining waste, combined with polymeric materials originating from polyester fabrics and post-consumer PET bottles, were converted into bricks with good technical properties for the construction of social housing units with clear environmental gains, low cost and energy savings.

Project: Nature needs to be relieved of the huge amount of industrial waste from mining and plastic that lies scattered across every country in the world.

It is possible to obtain bricks of adequate quality using mining and plastic waste that can minimize the growing demand for low-cost housing.



8–Breaking the Wall of non-polluting energy gene

Uysha de Souza Fonda, University of Campinas

Problem: Development of a new, less polluting means of generating energy, from radioisotopes generated by radioactive waste using photovoltaic cells, reusing radioisotopes.

Solution: Much of the radioactive waste generated by nuclear power plants or oil extraction is not reused and remains stored for years in repositories. This proposal presents a new way of generating energy using radioisotopes.

Project: Power generation from radioactive material.

9–Breaking the Wall of Digital Circuit of Poetry: Poetic Metaverse

Vladimir Souza, Cesar School

Problem: Observing the vandalism of statues in my city, I thought of an augmented reality app to integrate the monuments into people’s daily lives. Technology could connect younger generations with the history of the artists depicted and optimize the use of public space.

Solution: Create a web application that integrates the statues into a circuit where, through gamification, we can connect their stories within a system that educates and provides a new perspective on appreciating the monument and learning about the honorees’ histories.

Project: The “Digital Circuit of Poetry” project promotes poetry and literature through immersive realities. It uses augmented reality to broaden access to poetry, helping young people learn about their region’s history and preserve local culture.

10–Breaking the Wall of Invisibility and Bias

Fabiana Raulino da Silva, Pontifical Catholic University

Problem: Racism, exclusion, prejudice, invisibility of work, and lack of accessibility continue to marginalize and silence individuals in society.

Solution: On My Shoes is an immersive VR game designed to foster empathy and understanding by putting participants in the shoes of marginalized individuals, experiencing the discrimination and challenges they face firsthand.

Project: On My Shoes offers a unique, immersive VR experience that allows participants to live through the experiences of marginalized people, promoting empathy and understanding. Through five powerful phases, the game addresses discrimination issues, aiming to inspire social change and inclusivity.

11 – Breaking the Wall of Malaria Drug Resistance

Samuel Uzundu, Federal University of ABC

Problem: I would be tackling Antimalarial Drug Resistance (ADR). Resistant malaria parasites have taken out from clinical relevance almost all the antimalarial drugs except the Artemisinin Combination Therapy [ACT] which are currently under threat with ACT-resistant strains reported in Rwanda, Uganda & Kenya.

Solution: I would be developing a novel, smart, single exposure radical cure antimalarial nanoformulation against resistant strains of the malaria parasite. The delivery system for the formulation would be a Solid Lipid Nanoparticle [Sust. Release] that would be administered once and it will eradicate parasitaemia

Project: Tackling Antimalarial Drug Resistance in Africa by Using Novel, Smart Drug Combination and Repurposing Strategy to achieve a Single Exposure Radical Cure of Parasitaemia.

12 – Breaking the Wall of ADHD diagnosis

Maria Eduarda Tavares, Federal University of Rio Grande do Sul

Problem: Attention Deficit Hyperactivity Disorder (ADHD) is a trending topic on social media. However, this popularization often lacks a full understanding of the disorder's biological basis. Imaging genetics is a promising field aiming to unravel ADHD's pathophysiology.

Solution: Combining neuroimaging scans with genomic data enables the exploration and discovery of biological mechanisms linked to the disorder, enhancing patient assessment and providing more personalized treatment tailored to each individual's unique characteristics.

Project: Mental health is a major concern in our century, and in a hyperconnected world, attention deficits are increasingly prevalent. How can we distinguish a true disorder from the side effects of modern life? To better understand ADHD, we must explore its biological basis.

13 – Breaking the wall of Green Hydrogen Production

Hiran Catuninho Azevedo, Sergipe Development Agency

Problem: Aquatic macrophytes are plants that can affect ecosystems, navigation and electricity production. Macrophytes have vegetative parts that actively expand, causing problems power plants, and its excessive growth can affect multiple uses of water. Also, they are bioindicators of environmental problems.

Solution: The project presented here aims to address the environmental problem of macrophyte plants, turning this issue into an opportunity for research and business with the generation of green hydrogen from its biomass by methane reform and electrolysis.

Project: Opportunity to generate Green Hydrogen from the environmental problem of macrophyte plants.

14-Breaking the Wall of Educational Inequality

Maria Eduarda Oliveira, University of Campinas

Problem: Students in rural areas of Brazil face significant disadvantages in accessing quality education due to limited internet connectivity and a lack of digital resources. This digital divide perpetuates existing inequalities, hindering their academic progress and future opportunities.

Solution: I propose the development and implementation of Janela Rural, an offline-first educational platform designed for rural students in Brazil. Utilizing solar-powered devices and locally hosted servers, ConectaEdu provides access to a curated library of educational content, even without internet access.

Project: “Janela Rural” breaks down the wall of educational inequality by empowering rural students in Brazil with offline access to quality learning resources. This innovative platform leverages technology to bridge the digital divide and unlock the potential of underserved students.

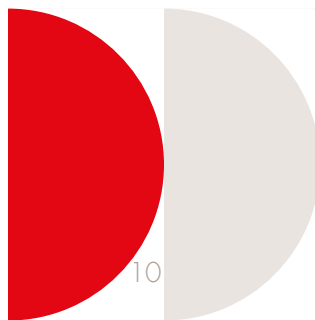
15-Breaking the Wall of Heating and Refrigeration

Guilherme Fidelis Peixer, Federal University of Sant Catarina

Problem: Refrigeration, heating, and air conditioning account for 17% of global electricity consumption and 7.8% of greenhouse gas emissions, with a demand expected to triple by 2050 and use fluids on phase-down schedules, since their global warming impact is thousands of times greater than carbon dioxide.

Solution: Magnetic refrigeration and heating can be used to decarbonize those systems since they rely on solid refrigerants, preventing the leakage of harmful substances, providing the potential to achieve high efficiencies and low electrical power consumption and refrigerants and magnets can be recycled.

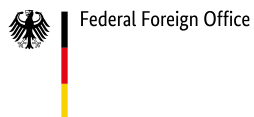
Project: The MagChill project was funded by public and private institutions and consisted of the development of a large-scale magnetic air-conditioner. AI techniques were used to design and control the system, which is one of the first prototypes to demonstrate the technology in a relevant environment.

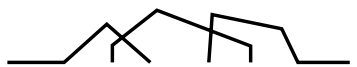


FALLING WALLS LAB BRAZIL

The organisers are independent partners of the Falling Walls Foundation.

PARTNERS

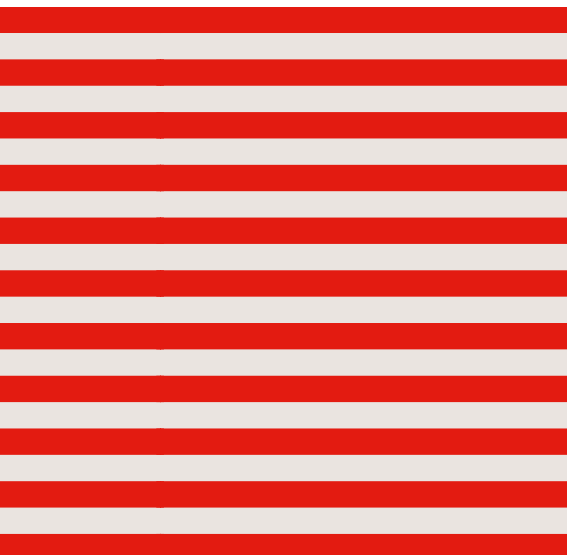




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