

Insights into VinFuture Prize



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Dear Distinguished Scientists,

I am delighted to introduce the fourth newsletter of the year 2023 from the VinFuture Foundation.

As you read through this newsletter, the diligent efforts of the Pre-Screening Committee have culminated in the completion of the pre-evaluation round. The curated nominations have advanced to the final stage of selection, currently undergoing meticulous review and judgment by the Prize Council. This critical phase brings us closer to identifying and honoring those exceptional individuals whose contributions are making a profound impact on our world.

In this newsletter, I am thrilled to unveil the theme for the third award season: **"Boundless Unity."** This theme embraces the very essence of the VinFuture Prize's values, revolving around diversity, global partnership, and interdisciplinary collaboration in the pursuit of scientific and technological solutions to universal human problems.

Looking ahead, I am excited to provide you with a glimpse of the forthcoming Award Ceremony Week in December. Our agenda promises an engaging lineup of events, including four thought-provoking panel discussions:

- Semiconductors Unleashed: The Backbone of Modern Innovation
- Advancing Precision Immunology for the Treatment of Autoimmune Disorders
- AI - Transformative Opportunities and Challenges
- Sustainable Infrastructure and Green Transportation

While more detailed information and registration forms will be made available soon, I encourage you to stay updated through our media channels for announcements.

Please also kindly keep in mind that nominations submitted after the May 15th deadline will automatically be considered for the subsequent year's season. Therefore, I encourage you to reach out to our dedicated Secretariat at secretariat@vinfutureprize.org for any assistance you may require during the submission process.

Lastly, it brings me great pleasure to share with you that the VinFuture Prize's website has undergone a significant revamp. Through this redesign, our aim is to enhance your experience when seeking information about the VinFuture Foundation. This enhancement will better serve your needs and provide a seamless platform for staying connected with the latest developments.

We hope you enjoy reading this newsletter, and thank you for your continued support in the development of the VinFuture Foundation and its Prize.

Warmest regards,
Dr. Thai-Ha Le
Managing Director





RECAP OF THE JULY INNOVATALK:

Understanding Medication - Gut Microbiome Interactions

The webinar was chaired by Professor Pascale Cossart, Pasteur Institute, Perpetual Secretary of the Academy of Sciences (France) and Member of the VinFuture Prize Council. The Distinguished Speaker was Dr. Nassos Typas, Group Leader and Senior Scientist at European Molecular Biology Laboratory Heidelberg (Germany). And representing the Vietnamese biomedical community was Dr. Chung The Hao, Wellcome International Training Fellow and Postdoc Scientist at Oxford University Clinical Research Unit (OUCRU).

Speakers discussed the role of the human gut microbiome, the impact of drugs on the microbiome and overall human

health, and the consequences of the overuse of antibiotics, along with the challenges and prospects of promoting research in this area in Vietnam. The webinar attracted over 150 attendees who were biomedical and nutritional experts from 21 countries such as America, Belgium, Germany, Japan, South Korea, etc. This demonstrates the appeal and importance of the topic of the human gut microbiome in the global biomedical community.

Rewatch the webinar here: <https://vinfutureprize.org/news-insights/carbon-capture-and-storage-solutions-to-mitigate-climate-change/>

AUGUST INNOVATALK WEBINAR: "A Green Future of Hydrogen Economy"

The fifth webinar of the InnovaTalk series in 2023 was held on August 23rd, 2023, in Hanoi, Vietnam (GMT+7). The purpose of the webinar was to explore the green future of hydrogen economy.

The webinar was chaired by Prof. Vivian Yam, University of Hong Kong (PRC) and a Member of the VinFuture Prize's Pre-Screening Committee. The Distinguished Speakers were Prof. Nigel Brandon, Imperial College London (UK), and Prof. Kazunari Domen, University of Tokyo (Japan). Representing the Vietnamese energy community was Mr. Ha Dang Son, Deputy Technical Director of the Vietnam Low Emission Energy Program II (V-LEEP II).



The speakers discussed the environmental and economic impact of hydrogen fuel, its sustainable generation using green energy, and the latest material technologies underpinning solar-powered fuel cells. The webinar attracted nearly 200 attendees who were material and energy experts from 30 countries such as America, the UK, Japan, Singapore, etc. This demonstrates the appeal and importance of the topic of hydrogen fuel cells in the global energy community.

Rewatch the webinar here: <https://vinfutureprize.org/news-insights/potential-and-challenges-in-the-pursuit-of-the-hydrogen-economy/>

GIẢI THƯỞNG CHÍNH VINFUTURE VINFUTURE GRAND PRIZE



Prize Categories

A Grand Prize of

US\$3,000,000

is awarded annually to proven breakthrough

Three additional special VinFuture Prizes **valued at US\$500,000** each



**Innovators from
Developing Countries**



Female Innovators



**Innovators with
Outstanding Achievements
in Emerging Fields**

Role of Nominators



Nominators are invited to nominate researchers, inventors, innovators in science, engineering, technology, or multi-disciplinary approaches to the VinFuture Prize.



Nominators contribute voluntarily to the development of science by nominating inventions to the Prize.



One nominator can make more than one nomination for each of the four prize categories, including the Grand Prize and three Special Prizes for Female Innovators, Innovators from Developing Countries, and Innovators with Outstanding Achievements in Emerging Fields.

Congratulations to **PROF. THALAPPIL PRADEEP**

Prof. Thalappil Pradeep, 2022 VinFuture Prize Laureate for Innovators from Developing Countries, has been awarded the prestigious International Eni Award.



Prof. Pradeep has been recognized for his work on affordable clean water using advanced materials. He “discovered advanced sustainable and affordable nanoscale materials for the removal of toxic contaminants from water. The discovered technologies are both sustainable and cost-effective and have been implemented as drinking water solutions benefitting 1.3 million people in India every day,” the citation stated.

This is the 15th edition of the Eni Award, a prize established in 2007. The aim of the award is to promote radical breakthroughs in energy efficiency, renewables, decarbonization and safeguarding of the environment, stimulating the work of new generations of researchers. It is sponsored by Eni, a global multibillion-dollar energy company headquartered in Rome.

The VinFuture Prize team extends our warmest congratulations to Prof. Pradeep for this well-deserved recognition.

Quick Read

As part of the High-Level Policy Dialogue on the Role of Indonesia as the Chair of the Association of Southeast Asian Nations (ASEAN) member states in 2023, the Managing Director of VinFuture Prize delivered a presentation on the Energy Transition and the “Ripple Effect” Impact on Regional Trade. The event took place on August 4, 2023, in Jakarta, Indonesia, and was attended by government leaders from Indonesia, along with experts from Princeton University, Alibaba Global Initiatives, the

Economic Research Institute for ASEAN and East Asia (ERIA), the Asian Development Bank Institute (ADBI), and ISEAS - Yusof Ishak Institute...

With this year’s theme being “ASEAN Matters: Epicenter of Growth,” Indonesia, in its role as Chair, put forth various priorities and initiatives to enhance ASEAN’s ability to respond to challenges and make ASEAN a driving force for global growth. As an active, proactive, and responsible member of ASEAN, Vietnam continues to collaborate with fellow member states in the effort to achieve the goals set forth for this year.



SCIENCE STORYTIME

PROFESSOR JENNIFER TOUR CHAYES:

To become reliable tools, AI needs humans

The integration of Artificial Intelligence (AI) into daily life is transforming the way we communicate, work, and innovate. In a recent interview, Prof. Jennifer Tour Chayes (University of California, Berkeley and a Member of the VinFuture Prize Council) anticipated that the future would promise both unprecedented opportunities and thought-provoking challenges related to AI. Although AI can assist humans in some professions, Prof. Chayes sees that it could not replace them, but collaborate harmoniously with human expertise.



How do you envision ChatGPT and similar AI language models shaping human communication and interaction in the future?

Professor Chayes: I expect that large language models (LLMs) such as ChatGPT will continuously be improved by their developers and take on more automated communication tasks. But these LLMs are only as good as the data and information they rely on and the algorithms used to improve them. There will need to be human involvement and engagement in making these models more useful to humans. We need more training, including reinforcement learning based on human judgements, to avoid so-called “hallucinations” – returning false information.

Beyond pure communication among humans, LLMs will have a profound impact on many other fields where, with the right “prompt engineering,” the LLMs can be trained to sort through information on very large scales. For example, I now have some work in collaboration VinFuture Prize Laureate Omar Yaghi, showing how using the right prompts and interactions with humans, LLMs can accelerate the synthesis of certain materials by two orders of magnitude.

How do you anticipate that AI will impact the job market in terms of replacing certain work skills? Can you provide examples of specific work skills or tasks that are likely to be replaced by AI in the near future?

Professor Chayes: There are certain professions that will change in that people will use more AI assistants – coding

(software engineering), paralegal work, etc. However, rather than replacing people, we will see an interaction between the AI assistant and the human.

On the other hand, what new career fields or opportunities do you foresee emerging as a result of AI advancements?

Professor Chayes: I anticipate continued growth in technical fields such as computer science and data science, and increased collaboration and connections with professions such as law, economics, journalism, medicine, and public health – to name just a few – in order to best use AI-enabled technology for good to help solve human needs and societal issues.

I see a huge opportunity in using AI for science. At the UC Berkeley College of Computing, Data Science, and Society, we’re developing new techniques for using relatively sparse data to make positive impacts on areas of societal importance, such as biomedicine and health, climate and sustainability, and human welfare.

Read the full interview here: <https://vinfutureprize.org/2023/08/09/professor-jennifer-tour-chayes-to-become-reliable-tools-ai-needs-humans/>



The inspiring spirit of a Vietnamese-born professor who found the "secret" of cancer cells

Professor Chi Van Dang said his interest in blood cancers or leukemia began from the impression of hematology. As his career evolved, the personal experiences in which many acquaintances died because of cancer even fueled his desire to explore the oncology area further. At the moment, his lab's central focus is the areas needing attention of oncology or cancer and finding answers to questions he has been curious about for a long time, such as "why don't certain patients respond to the same therapy".

In your opinion, what are some of the biggest obstacles, or you can say unanswered questions, in cancer research these days? How do you and your team plan to address these challenges?

Prof. Chi Van Dang: If you step back and look at the area of cancer research, what are the big questions? Maybe I'll just put it that way for discussion. So I think the big question is I keep on going back to the clinic. Cancer is not one disease. It's over 200 different types of diseases. That means each disease needs a different type of treatment. The first question is, what is the specificity, what is the characteristic of the different types of cancers, what do the different types of cancers require for treatment, and how do we cure liver cancer versus brain cancer, versus lung cancer? They require different therapies. We really need to treat these as different diseases and understand these to the detail that we can actually tailor therapy to those types of diseases. That's the first question, diseases specify therapy.

The second question is: Why is it that when you take 200 patients with apparently the same disease, a type of lung cancer, only 20% respond to therapy? That specific therapy for that disease, how I got only 20% and why the other 80% don't respond. So the second question is, what is human variability? Why am I different from you? Why you'd respond to certain drugs differently than I do? I think this is the level of research that's going to take years to really dissect, and understand individual variability. What is it about this patient versus this patient? One responds and one doesn't respond.

I think that's where biology will evolve to really understand all the factors that distinguish one person from the next and how to respond to therapy. This is where I think the evolution or revolution of all of these very high data generating technologies, we call them omics. We can study 20,000-30,000 genes at the same time. We can study metabolites hundreds of the same times, everything we can get a large amount of data. You can imagine if I gather all this data from you, we're talking about many parabytes.

So what are the challenges in cancer research? Basically the way I kind of look at this is that cancer is not one

disease, but it's really over 200 diseases. If you think about brain cancer versus liver cancer, versus lung cancer, each type of cancer requires a very specific, different type of care therapy. The therapy for brain cancer is very different from lung cancer or liver cancer.

I think the first scientific question is what is the difference between the different types of cancers? And do we understand well enough that we can come up with drugs that can treat that specific type of cancer? That's the first question. What are the details of the different types of cancer we understand enough at the molecular level, at the cellular level to be able to treat those effectively? Even if we have drugs that treat lung cancer, for example, which we have now, including immunotherapy, what we do know is that when you take hundreds of patients and you treat them with the same type of group of drugs, only a fraction of these patients will respond to therapy. Only very few of these patients will be cured. The real question is, why is it that with the same therapy, for the same disease, one person will respond and another person doesn't?

I think the second scientific question is what we understand about individual variability. Why is it that our medical conditions differ from each other?? That is, why do you respond to certain drugs differently than I do? I think this becomes a very complex problem.

It's a complex problem that requires an intense amount of data. I can study the disease itself using highly emerging technology that gives me literally hundreds and thousands, if not million data points to really pinpoint that particular type of disease. I can collect data from individuals. For example, different blood tests, your blood pressure, how much you sleep, also require a ton of data. What does cancer research look like in the future? I think putting all this together, including all the clinical information, we will need to rely on machine learning and artificial intelligence.

Read the full interview here: <https://vinfutureprize.org/2023/07/18/the-keys-inspiring-spirit-of-vietnamese-born-professor-who-found-the-secret-of-cancer-cells/>

WELCOME ON BOARD

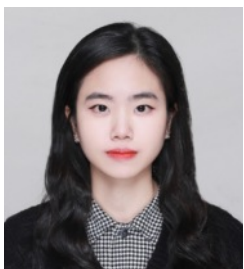


Associate Professor Van-Chien Pham - Secretary

Assoc. Prof. Dr. Van-Chien Pham is a senior expert in the field of earth science with over seventeen years of experience in education, research, and development of multidisciplinary projects on numerical models, water resources engineering, the environment, and natural disaster prevention and mitigation.

He holds a Ph.D. in Engineering Science from the Institute of Mechanics, Materials, and Engineering, Université catholique de Louvain (Belgium). His research interests mainly focus on developing numerical models, data-driven models, and artificial intelligence to simulate flow dynamics and tracer transport in land-sea continuums.

From 2014 to 2016, Assoc. Prof. Dr. Pham held positions as a postdoctoral researcher at the Institute of Mechanics, Materials, and Engineering at Université catholique de Louvain (Belgium) and at the Department of Civil and Environmental Engineering at the National University of Singapore (Singapore). He subsequently returned to Thuyloi University (Vietnam), where he was bestowed with the title of Associate Professor in 2020.



Ms. Ngoc-Quynh Nguyen, M.Sc. – Data Specialist

Ms. Ngoc-Quynh Nguyen obtained a Master of Biotechnology from the Department of Oriental Medicine Biotechnology at Kyung Hee University (South Korea), where she was a University President Scholar from 2019 to 2021. Her study at Quality Standardization Botanical-based Drug Development Center (South Korea) involved innovative experimental approaches to the treatment of hair loss, skin immunology, and skin stem cell biology.

In 2018, Ms. Nguyen was awarded the Research Scholarship to study the CRISPR/Cas9-based genome editing technology for improving the quality of crops at the Tsukuba Plant Innovation Research Center (T-PIRC), the University of Tsukuba (Japan). In 2019, she worked at The Biotechnology and Medical Device Technology Factory Company Limited (BIMEDTECH) – the first company in Southeast Asia to develop high-tech chip products for the diagnosis of genetic disorders and infectious diseases.

From 2022 to 2023, Ms. Nguyen served as a project researcher in studying the biological effects of stem cell transplantation on the senescence of frailty patients at the Vinmec Institute of Stem Cell Research and Gene Technology (Vietnam). She was responsible for analyzing and processing project data, and developing methods for studying the immune system. During her research career, Ms. Nguyen has participated in many government and corporate health and biotechnology projects.



Mr. Tung Hoang, M.Sc. - Member of the Secretariat

Mr. Tung Hoang is currently a member of the Secretariat at the VinFuture Prize, VinFuture Foundation. He has strong expertise in molecular biology related to cancer tumorigenesis and metastasis. During his time at Georgia Institute of Technology and Johns Hopkins University (USA), his research encompassed glioblastoma, metastatic castrate-resistant prostate cancer, and metastatic breast cancer.

In 2021, Mr. Tung Hoang graduated with the Highest Honor Bachelor degree in Biomedical Engineering from Georgia Institute of Technology, with the engineering product of breathing assistive device for patients with gastroesophageal reflux disease (GERD) and research on the autophagic signaling pathway affected by Apigenin in basal-like breast cancer. In the same year, he received the Vingroup Science and Technology Scholarship for Overseas Study for Master's and Doctoral Degrees.

In 2023, he graduated Summa cum Laude from the Bloomberg School of Public Health at Johns Hopkins University, obtaining a Master of Science degree in Biochemistry and Molecular Biology. Throughout this period, his research focused on cancer metastasis, specifically on genetic and epigenetic factors in the process of cancer migration and collective invasion.

WHAT TO EXPECT

InnovaTalk #6: Smart Transportation and Mobility Solutions for Urban Areas

The VinFuture Foundation's forthcoming September InnovaTalk webinar will include a panel of notable specialists in the subject of smart mobility. A famous researcher in Computer Vision and Artificial Intelligence, a Professor of Electrical Engineering and Computer Science at UC Berkeley, and a Chief Technology Officer at Microsoft Vietnam are among the panel in the upcoming webinar.



DATE & TIME:

10:00-11:00 AM (GMT+7) September 19th, 2023
20:00-21:00 AM (GMT-7) September 18th, 2023



SPECIAL GUEST FROM VIETNAM:

Dr. Le Nhan Tam - Chief Technology Officer, Microsoft Vietnam (Vietnam)



TOPIC:

Smart Transportation and Mobility Solutions for Urban Areas



LOCATION:

via Zoom



CHAIR:

Dr. Padmanabhan Anandan, AI Matters Advisors LLC (USA) and Member of the VinFuture Prize Council.



AUDIENCE:

Students, scientists, inventors and entrepreneurs in science and technology across the world



DISTINGUISHED SPEAKER:

Prof. Alexandre Bayen - Liao-Cho Professor of Engineering, UC Berkeley (USA)



LANGUAGE:

English with Vietnamese translation provided.



THE VINFUTURE FOUNDATION CONGRATULATES VINGROUP ON ITS 30-YEAR REMARKABLE JOURNEY

Kudos to Vingroup for an incredible 30 years and an inspiring journey to become one of the largest conglomerates in Vietnam! Its unwavering commitment to enhancing millions of lives through visionary leadership and groundbreaking innovations has made a long-lasting impact on Vietnam's landscape.

As Vingroup sets its sights on "Conquering New Horizons," VinFuture is confident that its passion, ingenuity, and determination will shine even brighter on the global stage. The transformation from a national powerhouse to a global innovation beacon speaks volumes about your steadfast pursuit of excellence.

Warmest congratulations from VinFuture to Vingroup and its amazing team of 70,000 trailblazers. We're excited for the next chapter and all the successes it will bring. Here's to embracing the challenges and opportunities with the same vigor that has defined your journey!

The VinFuture Foundation, established on International Solidarity Day on December 20th, 2020, is a non-profit organization co-founded by billionaire Mr. Pham Nhat Vuong and his wife, Mrs. Pham Thu Huong. The Foundation's core activity is awarding the annual VinFuture Prize, which recognizes transformative scientific and technological innovations capable of making significant positive changes in the lives of millions of people worldwide.



Please help spread the information to your network and let us know if you have any question by emailing us at secretariat@vinfutureprize.org

SUBMIT YOUR NOMINATION AT:
<https://online.vinfutureprize.org/nomination>

Contact

Website: <https://vinfutureprize.org/>

Email: secretariat@vinfutureprize.org

Address: VinFuture Foundation Office, Administration Building,
VinUniversity Campus, Vinhomes Ocean Park, Gia Lam District, Hanoi, Vietnam

*Thank you very much
for your support!*

From the VinFuture Foundation