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Professor Ricardo Martinez-Botas on his 60th birthday

Scientific careers, like particles in a turbocharger, rarely follow a straight path. They are shaped by curiosity, persistence, and the ability to see order in unsteadiness. The career of Professor Ricardo Martinez-Botas exemplifies this journey, which is a continuous exploration of flow, energy, and the subtle physics that govern engineering systems.

Ricardo Martinez Botas was on born on April 7th, 1966, in Madrid, Spain. His scientific path began with Aeronautical Engineering at Imperial College London in 1985, where he developed an early fascination with fluid motion and the machines that harness it. This interest led him to the University of Oxford, where he completed his doctoral studies in Turbomachinery in 1993 under the supervision of Professor Terry V. Jones. These formative years established the foundations of what would become a defining theme of his work: understanding real flows—not the idealized, but the unsteady, pulsating, imperfect flows that vehicle engineers must ultimately confront.

After a brief period in industry at Ove Arup Partnership, Ricardo began his academic career in 1994 as a Lecturer in Mechanical Engineering at Imperial College London, at the invitation of the late Professor Colin Besant. At that time, much of the turbomachinery research relied on steady-flow assumptions. However, most propulsion systems, such as internal combustion engines, turbochargers, and energy recovery devices, operate in inherently unsteady environments. Ricardo's instinct was to embrace this complexity and not to simplify it.

This choice, made repeatedly, defined his scientific identity.

Over the years, Ricardo has become one of the leading figures in the study of unsteady turbomachinery flows, particularly in turbocharger turbines. His work demonstrated how pulsating flows fundamentally alter the turbine behavior, efficiency, and design requirements. By combining carefully designed experiments with insightful modelling, he helped shift the field toward a more realistic and physically grounded understanding of turbomachinery operation. His contributions have been recognized with multiple Best Paper Awards from the ASME Turbomachinery Committee in 2009, 2010, and 2023.

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His standing in the engineering profession was further recognized by his election as a Fellow of the Royal Academy of Engineering in 2018. The Academy cited his outstanding contributions to improving the performance of diesel and petrol engines, particularly through his pioneering work on turbocharger turbine flows, where he and his team developed both the theoretical framework and experimental capability to understand realistic unsteady exhaust conditions.

Like all influential researchers, Ricardo did not simply answer the questions. He changed the questions being asked.

His research group at Imperial evolved into a distinctive environment in which experiments, theory, and industrial relevance coexisted. The SETTL group (Sustainable Energy Technology and Turbomachinery Lab, formerly the Turbocharger Group) became known not only for its technical capabilities but also for its guiding philosophy: that meaningful engineering advances arise from confronting real-world complexity with clarity, rigor, and creativity. Over the years, Ricardo has supervised more than 50 doctoral and postdoctoral researchers, instilling in them not only technical expertise but also confidence, independence, and resilience. His personal ethos is simple yet powerful: "*No one should leave my office less certain or less confident about their path than when they entered*".

Through this approach, he built enduring collaborations with industry and contributed to technologies that improve engine efficiency and reduce emissions, an impact that continues to grow in importance in the context of global decarbonization. His work has been closely connected with major industrial partnerships, including his leadership of the MHIET[1]–Imperial Future of Boosting Innovation Centre since 2019, and his long-standing collaboration with Universiti Teknologi Malaysia through the Low Carbon Transport in Collaboration (LoCarTIC) initiative, where he has served as Co-Director since 2014. These efforts exemplify his commitment to bridging fundamental research and industrial application across international contexts, around the world.

Therefore, it is fitting that his academic leadership extended naturally into industry-facing faculty roles. As the Associate Dean for Industry Partnerships in Imperial's Faculty of Engineering since 2023, he has worked to strengthen strategic relationships with global industrial partners, enhancing collaboration across engineering disciplines and ensuring that academic research remains closely aligned with real-world challenges.

Beyond turbomachinery, Ricardo's work has expanded to include broader engineering challenges, including energy systems, sustainable transport technologies, energy storage, and generative design. As the Theme Leader for Hybrid and Electric Vehicles within Imperial's Energy Futures Lab, he helped drive interdisciplinary research in low-carbon mobility. He has also contributed to the development of new research directions and infrastructure, supporting initiatives such as Electrochemical Science and Engineering activities across Imperial and the establishment of the Battery Laboratory within the Department of Mechanical Engineering. In each of these areas, the same intellectual thread is visible: a deep commitment to understanding how energy flows, how it is transformed, and how it can be used more effectively.

Ricardo's career is also marked by service and leadership. At Imperial College, he has been instrumental in shaping the Thermofluids Division and, more recently, the Department of Mechanical Engineering, where he took on the role of Head of Department in 2025. His international outlook is reflected in his visiting professorships at Universiti Teknologi Malaysia (2015–present), Shanghai Jiao Tong University (2019–2024), and Nanyang Technological University in Singapore (2016–2019), through which he has contributed to the global exchange of knowledge in thermofluids and energy systems.

His long-standing commitment to the professional community is equally outstanding. Through sustained service to the American Society of Mechanical Engineers, particularly within the International Gas Turbine Institute, he has contributed to shaping the global turbomachinery field, serving in multiple leadership roles, including on the Executive Committee and as Conference Chair. This trajectory of service culminated in his leadership of major international forums, including chairing the IMechE International Conference on Turbochargers and Turbocharging from 2019 to 2024, and his leadership in bringing the ASME Turbo Expo to London in 2024, which is the flagship global event in turbomachinery. His contributions to the community were recognized with the ASME Dedicated Service Award in 2023 and the Donald Julius Groen Prize from the Institution of Mechanical Engineers in 2021.

Yet, as in all meaningful scientific careers, what stands out is not only the body of work but the person behind it.

Ricardo is known among his colleagues and students for his clarity of thought, insistence on physical understanding, and his ability to challenge assumptions in a constructive and encouraging way. Many of his former students carry forward not only his technical knowledge but also his approach to engineering: **question** simplifications, **respect** experiments, and always return to the physics of the problem.

This legacyof ideas, people, and a positive philosophymay well be his most enduring contribution.

As we celebrate Ricardo Martinez-Botas on his 60th birthday, we recognize a career defined not only by achievements and honors but also by a sustained commitment to understanding how things work and supporting people in their ambitions. His career also reflects a deep belief in the strength that comes from diversity of thought, background, and perspective—an openness that has enriched his research, his collaborations, and the many individuals he continues to mentor with generosity and care.

On behalf of colleagues, collaborators, and students worldwide, we offer our warmest congratulations and look forward to the continued evolution of his ideas and influence.

Matei Ignuta-Ciuncanu[a,*], Maria Barrera-Medrano[b], Adrian Bejan[c], Teng Cao[b], Colin Copeland[d], Aaron Costall[e], Umit Gunes[f], Karl Hohenberg[g], Monica Marinescu[b], Peter Newton[h], Gregory Offer[b], Srithar Rajoo[i], Guillermo Rein[b], Miles Robertson[j], Alessandro Romagnoli[k], Mary Ryan[b], Nilay Shah[b], Philip Tabor[a], Billy Wu[b], William Worek[l], Bijie Yang[m]

[a] *Department of Nuclear Engineering, University of California, Berkeley, California, USA*
[b] *Imperial, London, UK*
[c] *Duke University, North Carolina, USA*
[d] *Simon Fraser University, Burnaby, Canada*
[e] *Cranfield University, UK*
[f] *Yildiz Technical University, Istanbul, Türkiye*
[g] *Rimac Technology, Zagreb, Croatia*
[h] *Department for Business, Energy and Industrial Strategy, London, UK*
[i] *Universiti Teknologi Malaysia, Johor Darul Ta'zim, Malaysia*
[j] *About:Energy, London, UK*
[k] *Nanyang Technological University, Singapore*
[l] *Argonne National Laboratory, Illinois, USA*
[m] *Loughborough University, UK*

[*] Corresponding author at: Department of Nuclear Engineering, University of California, Berkeley, CA, USA.
E-mail address: mi3618@ic.ac.uk (M. Ignuta-Ciuncanu).

[1] Mitsubishi Heavy Industries Engine & Turbocharger