



The Combustion Institute

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Alex Y. Klimenko

2024 Candidate Profile: The Combustion Institute Board of Directors

Reasons for Nomination

I have been engaged in research on combustion and reacting flows since my undergraduate years, joining the Soviet Section of the Combustion Institute in 1991 and the Australian Section in 1993, subsequently developing close contacts with the American, UK, German, and other sections. My primary contribution to combustion science includes introducing conditional methodologies (CMC, MMC, PCMC, etc.) and the 4/7 power law for premixed turbulent combustion. As Director of the Energy Centre at The University of Queensland, overseeing around 50 people, I've established numerous government and industry contacts, providing insights into emerging changes in the energy sector.

If elected to the Board of Directors of The Combustion Institute, I will work to guide the young generation of scientists through the global energy transition towards decarbonisation, emphasising the critical role of combustion science and the necessity of e-fuels for future power systems. I will bring my positive experience of the ANZ section to the entire Institute, cooperating with our colleagues in the Asia-Pacific region and around the globe to uphold our intellectual and professional leadership in evolving conditions. I will prioritise social inclusion and interdisciplinary cooperation with relevant scientific communities to foster a realistic understanding of emerging energy transition options.



See the next page for the candidate's curriculum vitae.

Current Positions:**The University of Queensland, Australia**

- **Director**, The Centre for Multiscale Energy Systems (Energy Futures),
- **Leader** Combustion and Multiscale Modelling Group
- **Reader** in Fluid Mechanics and Thermodynamics
- **Program Leader**: All postgraduate coursework programs

Education:

- **Doctor of Engineering**, 2007, (D.Eng., High Doctorate), *The University of Queensland*.
- **Graduate Certificate in Education**, 1998, Higher Education, *The University of Queensland*.
- **Ph.D. in Science**, 1992 (Mechanics of fluids and plasma) *Moscow University*
- **ME/MSc**, 1985, Aerospace Engineering (Gas dynamics and combustion), *MPhTI*,
- **High School Diploma**, 1979, *Kharkiv School No 27 with advanced education in Physics and Mathematics*

Selected Professional Honors, Awards, Fellowships, and Visiting Appointments:

Fellow of the Combustion Institute (*inaugural class*, in recognition for originating the *conditional methods*)

Visiting Professor, *Tsinghua University*, China;

Visiting Professor, *University of Wyoming*, USA;

Guest Professorial Fellow, *Karlsruhe University* (KIT) Germany;

Senior Visiting Fellow, Centre for Turbulence Research at *Stanford University*, USA;

Visiting Faculty, *Cornell University*, USA;

Visiting Fellow, Forschungszentrum (Research Centre) Karlsruhe, Germany;

Visiting Scholar and ARC PostDoc Fellow, *The University of Sydney*, Australia

Scientific Record and Service to Combustion Community

Publications: >200 publications including 2 books, 7 book chapters, >100 journal papers, and 18 invited papers, presentations and keynotes. The publications are cited >4500 times with h-index of 30 and i10-index of 71 (Google Scholar), the principal work on conditional methods is cited >1000 times

Invited to give talks in more than 20 leading universities and institutes around the world including Systemic perspective on technological change presented at *Santa Fe Institute* (USA) and *Max Planck Institute* (Göttingen, Germany).

Editorial: Principal Editor of 3 special issues, an Elsevier Book, 2 conference proceedings, Acting Chief Editor, Open Thermodynamics Journal

Service: Chairing: 2 international conferences, 2 ANZ combustion symposia, international committee for the Bilger Award, an expert panel in Houston. Member of Combustion Institute Soviet Section (1991), ANZ section (1993).

Selected Publications:

- Klimenko, A. Y. and Williams, F. A. (2013). *On the flame length in firewhirls with strong vorticity*. Combustion and Flame, 160 (2), 335-339
- Klimenko, A. Y. and Pope, S. B. (2003). *The modeling of turbulent reactive flows based on multiple mapping conditioning*. Physics of Fluids, 15 (7), 1907-1925
- Klimenko, A. Y. and Bilger, R. W. (1999). *Conditional moment closure for turbulent combustion*. Progress in Energy and Combustion Science, 25 (6), 595-687.

Principal contributions to combustion science:

Introducing conditional methods (CMC, MMC) and sparse-Lagrangian methods, generalising CMC for heterogeneous reacting flows, introducing Intrinsic Disturbed Flamelet Equations for analysis of premixed disturbed flames, suggesting the 4/7 power law for cascade propagation of turbulent premixed flames, demonstrating the 4/3 power law for firewhirls and hurricanes.