

COMBUSTION WEBINAR

Is it and should it be the end of combustion research as we know it?

Speaker: Gautam Kalghatgi

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Biography: Gautam Kalghatgi worked for 31 years at Shell Research in the U.K. followed by 8 years in Saudi Aramco before retiring in June 2018. He has been a Visiting Professor at Oxford University; Imperial College, London; KTH Stockholm; TU Eindhoven and Sheffield University and has been recently appointed as a Consultant Professor at Shanghai Jiao Tong university. He is a Fellow of the Royal Academy of Engineering, SAE and I.Mech.E.. He has published around 140 papers and a book, “Fuel/Engine Interactions”, on combustion, fuels and engine research and on transport energy and has also edited two other books on engine research. This work is cited widely with a current H index of 59 on Google Scholar. He has received many awards for his work including the 2021 ASME Internal Combustion Engines award, the Huw Edwards award of the Institute of Physics for his contributions to combustion science and the SAE Horning Award. He has a B.Tech. from I.I.T. Bombay (1972) and a Ph.D. from Bristol University (1975) in Aeronautical Engineering. His PhD project was on supersonic jet impingement. He did post-doctoral research on turbulent combustion at Southampton University (1975-1979) before joining Shell.

Abstract: The dominant narrative in the affluent west is that climate change poses an “existential threat” and very rapid cuts in greenhouse gas (GHG) emissions and hence fossil fuel use are needed to avoid it. Combustion is demonised and policies are in place to eliminate it. However, to replace just 60% of current fossil fuel use, the world will have to build 9400 GW of new, continuous CO₂-free power generation capacity. Simultaneously oil, gas, coal, aviation, steel and cement industries and livestock farming have to be largely shut down to eliminate GHG and global lifestyles have to be transformed. This will not happen by 2050, let alone 2030. Transport is particularly difficult to decarbonise and current policies focusing entirely on battery electric vehicles will not and should not succeed. Global GHG levels are unlikely to come down significantly in the next several decades and even if they did, extreme weather events will not disappear. It is better to recognise such realities and make societies more resilient to the effects of any future climate change. Humanity will have to adapt to any further warming as it has done with the previous warming of about 1.1 °C over the past century. Combustion research, particularly in engine combustion, might be seen as unwanted in some countries in the short term though it will be absolutely necessary in order to ensure that energy use is improved since combustion of fossil fuels will continue to be very significant for decades to come. The gap between current policies and reality will need to be bridged but it is not clear how this will come about.

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