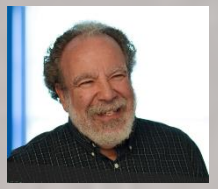
New Developments in Fusion Energy

Friday, April 1st, 2022
12:30 PM
Maeder Hall, Room 002

MAE Seminar Series



Robert J. Goldston
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The National Academies has recommended that U.S. fusion R&D now focus on a Pilot Plant that can put net electricity on the grid in the 2040s, and has even specified the desired characteristics for such a pilot plant. This has created a focus point for publicly funded research, as well as for venture-funded private companies. So what's driving this? There is a deepening scientific understanding of fusion systems; the assembly of the international fusion experiment, ITER, is now underway; Commonwealth Fusion Systems has demonstrated very high field magnets; Inertial Confinement Fusion has gotten a shot in the arm due to results from the National Ignition Facility. Private investment in fusion is now approaching $2B. So when can we have fusion? How could it contribute to a world energy economy with plenty of solar and wind? Some of the private ventures are promising fusion electricity on the grid in the 2030s, but even so, fusion is not going to "beat out" renewables by 2050. However that is not the question; the question is as renewables grow in absolute power production and in market share, and as energy needs continue to grow, what role can low-carbon "dispatchable" energy like fusion play, and can fusion be in time to play that role?

Robert J. Goldston is a Professor of Astrophysics at Princeton University. He received his B.A. in Physics from Harvard University, and his Ph.D. in Astrophysical Sciences from Princeton University. He was director of the Princeton Plasma Physics Laboratory (PPPL), 1997 – 2009. He is Associated Faculty with the Department of Mechanical and Aerospace Engineering and Affiliated Faculty with the Program on Science and Global Security. Goldston won the American Physical Society "Excellence in Plasma Physics" award in 1988 and chaired the American Physical Society Physics Policy Committee 2007 – 2009. He won the Fusion Power Associates Leadership Award in 2001, the Nuclear Fusion "Most Outstanding Paper" prize for 2012, and was named a "Leading Global Thinker" by Foreign Policy Magazine in 2014 for his work on arms control. His current research interests include understanding and mitigating high heat fluxes at the edge of fusion plasmas and developing verification technologies for arms control and non-proliferation. He is the longest-standing U.S. representative on the ITER Science and Technology Advisory Committee. He serves on the board of the Council for a Livable World and writes occasional policy pieces for the Bulletin of the Atomic Scientists.

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