Us National Academy Honors Two From India

By Francis C. Assisi

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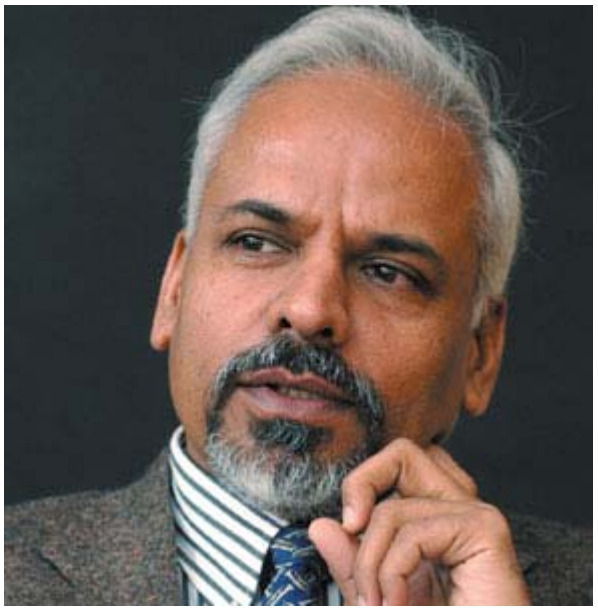
Indian-American physicist Katepalli Sreenivasan and Indian Agricultural Economist Prabhu Pingali are among 72 new members and 18 foreign associates inducted into the National Academy of Sciences this week in recognition of their distinguished and continuing achievements in original research.

Sreenivasan a Professor of Engineering and distinguished university professor, University of Maryland, is one of the few Indian-American scientists who have been educated entirely in India. After obtaining a Ph.D. (with gold medal) in Aeronautics from the Indian Institute of Science in 1975, he did post-doctoral work at the Universities of Sydney and Newcastle in Australia and at the Johns Hopkins University in Baltimore.

Pingali obtained a Ph.D in Economics from North Carolina State University and joined the World Bank's Agriculture and Rural Development Department in 1982.

Both distinguished scientists are high on their desire to alleviate poverty.

Sreenivasan recalled when he was appointed director of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy: "When I was about 12 or 13, my family priest taught me a prayer and said that I was to recite it 108 times a day: one hundred for myself and eight for the rest of humanity. If I did not find the time for 108 recitations, I should do 58, 50 for myself and eight for humanity. And if I couldn't do 58, I should do 33, 25 for myself and eight for humanity. The point is that no matter how much or how little one does for oneself, one should always contribute a constant amount for humanity." He said that furthering the cause of science "may be my way of contributing to the rest of humanity."



A world-renowned experimental physicist whose major fields of interest are fluid dynamics and turbulence, Sreenivasan is currently a professor of physics and mechanical engineering at the University of Maryland, US, where he also directs the Institute for Physical Science and Technology.

Sreenivasan has a broad range of research interests, and is known for his work in fluid dynamics, especially turbulence and other nonlinear phenomena. Sreenivasan came to Yale, via Johns Hopkins University, in 1979 as assistant professor of engineering and applied science. He was promoted to professor of mechanical engineering in 1985 and was named to the Cheel chair in 1988. He chaired the department of mechanical engineering 1987-92 and was acting chair of the then-Council of Engineering in 1989.

Broadly speaking, Sreenivasan's area of research involves the understanding of a wide range of nonlinear and nonequilibrium problems, with a focus on turbulent flows. "I was the founding chairman of the American Physical Society's Topical Group on Statistical and Nonlinear Physics. My research includes turbulence in the atmosphere, oceans, aerodynamics, blood vessels, and even home-heating systems. The major challenges facing those studying turbulence is to understand how properties vary as a control parameter is increased and to relate these aspects to the governing equations. This is the spirit of my work. One specific problem my colleagues and I have been working on recently is thermal convection: studies of the motion of fluid to better understand how thermal energy is transported from one part of a system to another-say, from the centre to the edge of the sun; or from the centre to the surface of the earth; or, more simply, from the bottom to the top of a heated pot of water. Typically, the experiments consist of a container with fluid (helium at a few degrees Kelvin) that is heated on the bottom. The fluid on the bottom of the container expands and becomes lighter, causing it to rise to the top. Meanwhile, the fluid at the higher levels of the container, which is colder and denser, tends to sink to the bottom. This creates a continuous motion representing a form of turbulence. The description makes the process sound deceptively simple but it is not. For example, small changes in boundary conditions can lead to dramatic changes in behaviour that are far from easy to understand."

Prabhu Pingali, an Indian national, has devoted his entire career to agriculture in developing countries, living and working in all three developing continents. His research and advisory work has focused on technological change, environmental externalities, and agricultural development policy. He has published prolifically, authoring (or co-authoring) 9 books and 90 journal articles and book chapters. After obtaining a Ph.D in Economics from North Carolina State University, Pingali joined the World Bank's Agriculture and Rural Development Department in 1982. His first book, Agricultural Mechanization and the Evolution of Farming Systems in Sub-Saharan Africa, won AAEA's Quality of Research Discovery Award in 1988. Starting in 1987, he spent 15 years in the CGIAR, first at IRRI in the Philippines and then at CIMMYT in Mexico.

His most significant work during this time was to quantify the human and environmental costs of pesticide use, for which he received multiple international awards. He is currently the Director of the Agricultural and Development Economics Division, a policy think tank

within the Food and Agricultural Organization of the United Nations. Pingali is also the Past-President of the International Association of Agricultural Economists (IAAE). He was elected Fellow of the American Agricultural Economics Association in 2006. Also in 2006, he was appointed to the U.S. National Academies Round Table on Sustainability.

Pingali has over twenty five years of experience in analyzing food, agriculture and development policy in Asia, Africa and Latin America. He was a visiting scholar at Stanford University, Food Research Institute, and an Affiliate professor at the University of the Philippines at Los Baños.

Last year, in a working paper entitled Eradicating Extreme Poverty and Hunger he discussed four major trends shaping the future food economy and consequently the prospects for meeting the hunger and poverty goals. These trends are: i) rapid urbanisation in the developing world and its impact on food markets; ii) increasing integration of global food markets through trade; iii) deterioration of natural resource base and the degradation of the global and local commons; and iv) rising transactions costs in the acquisition and use of science and technology for development.

He concluded: 'The lessons to date suggest that no sustainable reduction in poverty is possible without improving rural livelihoods. Economic growth originating in agriculture can have a particularly strong impact in reducing poverty and hunger. Increasing employment and incomes in agriculture stimulates demand for non-agricultural goods and services, providing a boost to non-farm rural incomes as well. The corollary to this is that additional demand for agricultural products must come from outside of the rural communities and the communities must be able to meet the expectations of these external markets.'

Pingali has confirmed that hunger reduction is a prerequisite for fast development and poverty reduction. 'Poverty is a cause of hunger, but it is equally true that hungry people will always bepoor. Hungry people cannot take full advantage of a pro-poor development strategybecause hunger negatively affects health, labour productivity and investment choices,perpetuating poverty. It has been calculated that for each year that goes by withoutreducing hunger, developing countries suffer a total loss of about 500 billion US dollars in terms of lifetime earnings foregone due to hunger and nutritional deficiencies. Investment in hunger reduction is too often seen as "welfare" whereas, in practice, it is an investment with a potential for generating high economic rates of return.

It is obvious that hunger reduction is critical for reducing poverty but for also meeting the international goals related to health, child and maternal mortality, education and literacy. Poverty reduction is faster when carefully targeted programmes, such as food for work, provide immediate hunger relief. Pingali believes that technology can make a difference but under the right conditions: 'Improved technology, especially for small-scale farmers, hastens poverty reduction through increased crop yields and higher incomes. …Technologies that build on and complement local knowledge tend to be particularly effective in meeting the needs of poor farmers in marginal environments.'

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