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## Bonding with chemistry

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Dr. A. Ajayaghosh Photo:S.Gopakumar

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**City-based scientist Dr. A. Ajayaghosh's pioneering work in the field of supra-molecular chemistry has won him the 2012 Infosys Prize for physical sciences**

"I'm still very much a student of chemistry," says A. Ajayaghosh, CSIR-Outstanding Scientist at the National Institute of Interdisciplinary Sciences (NIIST), Pappanamcode, as he gets ready to take the flight to New Delhi to collect this year's Infosys Prize for outstanding contribution to physical sciences. Dr. Ajayaghosh becomes the second Malayali (after Pune-based, city-native theoretical physicist-cosmologist Professor Thanu Padmanabhan) and the first scientist working in a Kerala-based institution to win the prestigious award instituted by the Infosys Science Foundation. The scientist and the other laureates of the Infosys Prize 2012 will be felicitated by Gro Harlem Brundtland, former Prime Minister of Norway and former Director-General of the World Health Organisation, today (January 3) at the Taj Palace Hotel in New Delhi.

"Chemistry is an evolving subject and every day I learn things about its nuances that amaze me. This award is not mine alone; it is the result of years of hard work by my students and my co-workers too. I currently have 14 PhD students working with me and I have, over the years, supervised 16 others for the degree. I learn a lot about chemistry from my students," says Dr. Ajayaghosh, who works in the areas of organic chemistry, photo chemistry and polymer chemistry.

His focus area is supra-molecular chemistry, which deals with molecules and molecular assemblies. "In scientific terms, my area of research is called self-assembly of molecules to make different types of supra-molecular architectures," says Dr. Ajayaghosh.

"What we do is, we make molecules and put them into different functional groups. We can thus study how the molecules interact and communicate when they are allowed to come closer. In simple terms, it's sort of like building architecture with bricks and mortar; only here bricks are the molecules and the mortar are certain weak interactions or forces. The molecules come together and depending on their nature they can form different kinds of architecture – as different as single storied houses, double stories, and apartments or as different a ribbon, a spear, a container or an *uzhunuvada!*" he explains.

Dr. Ajayaghosh's research work has led to the design and synthesis of molecular assemblies called organogels (also

called pi-gels), a new class of materials with much potential for photonic and electronic applications. "Pi-gels can be used in catalysis, in tissue engineering, for anti-forgery or security labelling of documents and currency, for diagnostic purposes...the potential applications of this 'soft material' is tremendous," says the 50-year-old scientist from Vellimon, a remote village in Kollam district.

What is rather remarkable about Dr. Ajayaghosh's story is that he is a "completely home-grown scientist." After completing high school from Government Boys High School, Chavara, Kollam, he graduated in chemistry from S.N. College, Kollam, and went on to complete both his masters and his PhD from the University of Calicut.

"My love for chemistry was nurtured by my high school chemistry teacher, Chandrashekar Nair. Rather than rote teaching, he used to demonstrate each and every aspect of the subject and then some. I remember being particularly fascinated by the colour changes of different chemical reactions. I think that all high school students, especially those of today, need such extraordinary science teachers. We need teachers who can make the subject fun and interesting; who can inspire students to take up science as a profession," says Dr. Ajayaghosh.

"In the past 15 years or so, science research in India has seen tremendous development. When I started out in in the late 80s at NIIST, then known the Regional Research Laboratory, there weren't many institutions like it in India which had top quality infrastructure for research. Nowadays, there are many facilities, institutions, opportunities, and plentiful grants and money available for scientific research. Society needs to change its attitude to science. I hope that recognitions like the Infosys Prize inspire talented students to lead India into new frontiers of science research," he adds.

Dr. Ajayaghosh lives in Kaimanam with his wife, Ambili, a chemistry teacher at Christ Nagar School, Thiruvallam, and sons, Ananthkrishnan (a software engineer at Delloite) and Anantharaman, a Plus One student. In his spare time, the scientist enjoys gardening, especially bonsai cultivation, and listening to music. "Gardening is very much like research; they both need imagination, creativity, effort and patience!"

#### *The Infosys Prize*

*Instituted by the Infosys Science Foundation, the Infosys Prize is an annual award that 'endeavors to elevate the prestige of scientific research in India and inspire young Indians to choose a vocation in scientific research'. It honours contemporary researchers and scientists across six categories – engineering and computer sciences, humanities, life sciences, mathematical sciences, physical sciences and social sciences. Each award includes a gold medal, a citation and a purse of Rs. 50 lakh. According to the citation, Dr. Ajayaghosh was chosen for the award 'for his pioneering development of methods for the construction of supra-molecular functional materials, which can be employed as components in organic electronic devices and in powerful substance selective optical sensing and imaging.'*

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