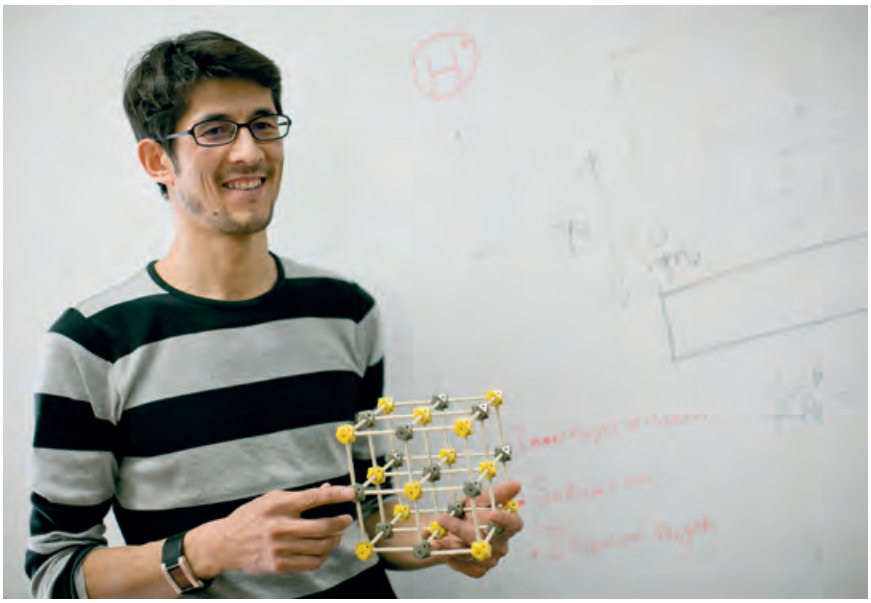

◀ Mirabbos Hojamberdiev [Photo provided]

INNOVATION FOR CLEAN ENERGY

by **Cristina Serra**

Mirabbos Hojamberdiev, winner of the 2015 Atta-ur-Rahman Prize, explores whether hydrogen could be the answer for clean energy needs.

The world's demand for energy is rising – according to some measures, by more than 70% from 2012 to 2040 in the developing world. The emission of greenhouse gases is rising, too, and many cities in the developing world are plagued by severe air pollution linked to the use of fossil fuels.

Mirabbos Hojamberdiev, a chemist from Tashkent, Uzbekistan, is exploring a novel method for generating clean energy: he is developing inorganic crystals that can generate hydrogen from water molecules when hit by solar light. For this work, Hojamberdiev has won the 2015 Atta-ur-Rahman Prize in Chemistry.

The prize acknowledges accomplished young chemists who live and work in scientifically lagging countries. The prize is worth USD5,000, and winners are invited to attend the TWAS General Meeting and give a lecture on their work. The prize is provided by TWAS Fellow Atta-ur-Rahman of Pakistan, a leading scholar in organic chemistry and a globally influential advocate of science education.

"The TWAS Atta-ur-Rahman Prize is an unique recognition in the world for young scientists coming from developing countries," Hojamberdiev said. "Being an important international prize, it will give even more motivation and encouragement to my work, and it will be a matter of pride for my country."

Hojamberdiev is a senior researcher in the department of natural and mathematic sciences, Turin Polytechnic University in Tashkent, Uzbekistan. As an undergraduate, he developed an interest in environmental issues. Over time, he also developed an interest in materials science. For more than 12 years, he has worked with a range of international partners on the development of novel advanced materials.

Hydrogen has significant potential as a source of renewable energy, but current hydrogen production requires an inefficient industrial process.

"Using sustainable energy sources such as solar, wind, hydro, or biomass to reduce greenhouse gas emissions and non-renewable resource exploitation is becoming mandatory," Hojamberdiev says. "Hydrogen is a clean source of energy ... but we need to find the way to produce it routinely and at little cost."

The inorganic photocatalysts that Hojamberdiev uses to assemble crystals exhibit high photocatalytic activity for water splitting, and have several advantages: they are inexpensive, non-toxic, abundant – and recyclable. And some research suggests that a similar procedure can clean polluted water.

"The whole system is in its infancy now," he said. "We have chosen some materials and tested their performance. Today we are working to make the process even more efficient and feasible for scaling-up." ◘

Learn more:
www.twas.org/node/11455