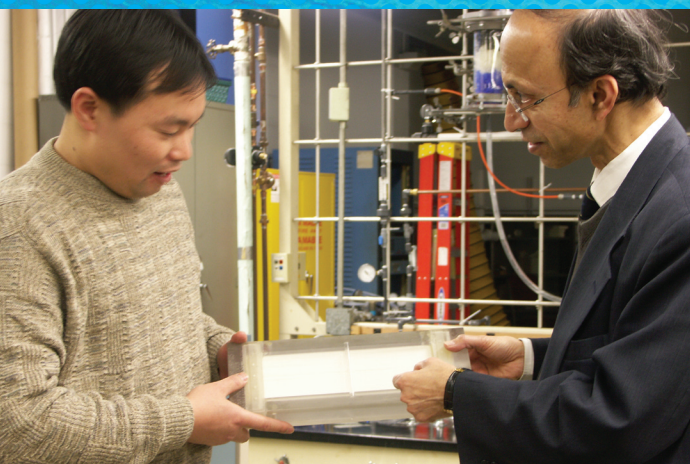


Quenching the

WORKING TO MEET A GLOBAL CHALLENGE AT NJIT



People around the world don't have enough pure water to drink. According to the Public Health Foundation, one in six people lack access to safe water, and the United Nations reports that more people become seriously ill from water-borne diseases than from any other sickness.

Desalination researcher Kamalesh Sirkar with postdoctoral fellow Liming Song, who has participated in NJIT's investigation of membrane-based distillation as an efficient and economical way to meet the critical global need for pure water.

NJIT researcher Kamallesh Sirkar is at the forefront of developing an effective solution to this global challenge — the desalination of seawater and brackish groundwater using membrane-separation technology. Sirkar, whose membrane-based research has many additional real-world applications, is distinguished professor of chemical engineering, Foundation professor of membrane separations and director of NJIT's Center for Membrane Technologies.

Although several desalination techniques are in use worldwide, membrane separation is perhaps the most promising among the newer technologies. Essentially, membrane desalination depends on creating special polymeric membranes that block the passage of salt molecules, producing pure, potable water as it passes through a membrane.

World's Thirst

Sirkar's investigation of an innovative membrane-based desalination technique that's both efficient and economically viable is described in the following 2006 overview of desalination reprinted from the journal *Science*. As the *Science* writer states, the pioneering NJIT membrane-distillation technology is well on its way to proving itself in the real world.

The research at other locations described in the article underscores that NJIT shares this frontier with institutions such as Massachusetts Institute of Technology, Lawrence Livermore National Laboratory and Yale University. The article emphasizes that the researchers who are evaluating membrane desalination techniques and materials — including NJIT's Sirkar and his colleagues — are engaged in an effort of great significance for the advancement of science and the well-being of people throughout the world.

In addition to desalination, membrane technology using polymeric or ceramic membranes has almost boundless potential for other applications that require selectively separating the molecular components of liquids and gases. Vital to a host of industries, supplying membrane-separation technology is today a multi-billion-dollar business, and NJIT's research and development efforts in this area have led to a substantial number of patents.

For many applications, creating membranes with minute pores is often the key to determining which molecular components of a liquid or gas will pass through a membrane. In nanofiltration membranes, for example, the pore size is 0.5 to 2 nanometers. A nanometer is a billionth of a meter, or about ten hydrogen atoms in a row.

More information about membrane-based research at NJIT can be found in the article "From Beer to Blood," which appeared in the winter 2004 NJIT Magazine. The article is available online at <http://magazine.njit.edu>.