

2009-10 Princeton Global Scholar

Takao Someya. Professor Someya of the University of Tokyo is one of the world's leading experts in large-area organic electronics and circuits. He has received a number of awards, most recently a Japan Society for the Promotion of Science Prize (awarded in the presence of the Crown Prince of Japan), and the 1st Prize of the newly established German Innovation Award. He is a member of the board of directors of the U.S. Materials Research Society, one example among many of his constructive participation in professional societies and of his engagement in the international research community. On April 1, 2009, he occupied a new chair at the University of Tokyo that was created specifically for him.

His research ranges from physics to materials and processes to devices and circuits, which he crafts in innovative and unconventional configurations. He has demonstrated wireless power transfer (e.g. laptop charging from a grid embedded throughout a tabletop), the elements of electronic skin (e.g. demonstrating a robotic hand with sense of touch), and other visionary applications of large area electronics (such as a sheet of electronically programmable Braille). Soon to be seen is a “wearable ultrasound” fabric, such as for 24/7 fetal monitoring.

Professor Someya will collaborate on three of his current research activities with partners at the Princeton Institute for the Science and Technology of Materials (PRISM) and the Departments of Electrical Engineering and Chemical Engineering, who are among the leading U.S. researchers in the rapidly growing area of large-area organic electronics. Professors James Sturm and Sigurd Wagner in Electrical Engineering will be involved in collaboration on stretchable organic light-emitting diode (OLED) display driven by organic transistors. Professors Lynn Loo, Chemical Engineering, and Antoine Kahn, Electrical Engineering, will partner in research on application of self-assembled monolayers (SAM) to a large-area electronic system. Professors Lynn Loo and James Sturm will also collaborate on the third research project on printable digital memory.

In his research interactions with students within Electrical Engineering, PRISM and the new Andlinger Center in Energy and the Environment, Professor Someya will focus upon large-area organic electronics which covers fundamental physics of organic devices, printing processes, and applications of flexible and stretchable electronics and bring his prototypes of artificial skin and wireless power transmission sheets for demonstrations. Depending on opportunities for travel, he will weave visits to Princeton by other Japanese researchers to show prototypes of electronic paper and other flexible devices.

Professor Someya has simplified segments of his classroom course for public lectures to broad audiences, which are anticipated to be presented within the newly established Keller Center on Engineering Education. He has frequently lectured to adults and in educational activities for children in a class for high school students at the National Museum of Emerging Science. His lectures elicit enthusiasm for and fascination with leading-edge science and technology.

As a Princeton Global Scholar, Professor Someya's appointment will further Princeton in

becoming a leader in the research of a new and rapidly growing field of engineering. The University of Tokyo will host exchange visits of Princeton professors, scholars, and students through the sponsorship of "Global Center of Excellence Programs", furthering a strong alliance between Princeton and the University of Tokyo. Princeton's Keller Center for Engineering Education and Andlinger Center for Energy and the Environment will acquire a valuable component at their start and Princeton will build a durable tie with the University of Tokyo, which is the top university in Japan.