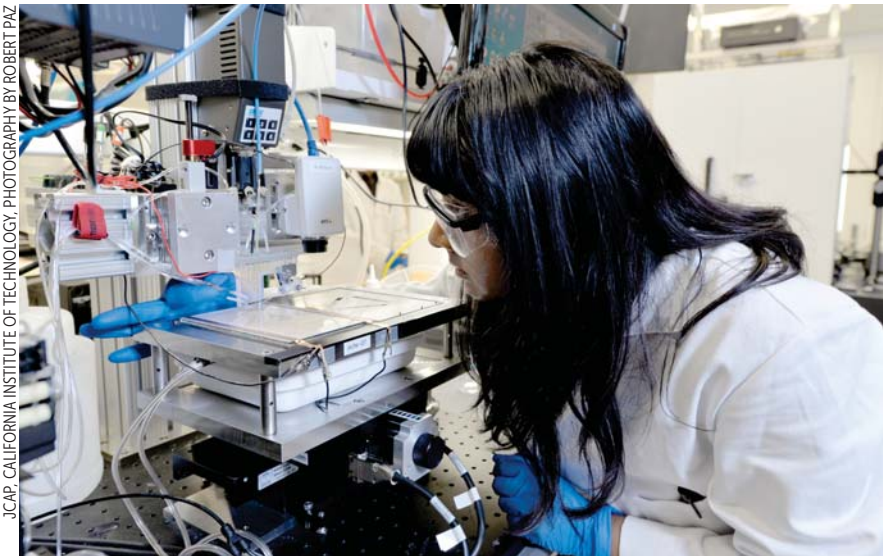

JCAP, CALIFORNIA INSTITUTE OF TECHNOLOGY. PHOTOGRAPHY BY ROBERT PAZ

SCIENTIST ANIKETA SHINDE works on the rapid screening of materials for solar-fuels generators in the high-throughput experimentation laboratory at Caltech.

cells. "Most of us realize we're not going to split water with some simple material like metal oxide powder in a solution," Grader admits. Why not just use well-established photovoltaic-powered electrolysis? Grader and Rothschild's analysis finds that the photoelectrochemical process has the potential to increase water-splitting efficiency by 30–40% relative to PV electrolysis. And the catalysts that are developed will be less costly than the rare earths and platinum group metals currently used in electrolysis.

As PHYSICS TODAY went to press, the Technion team was days from publishing its novel approach for generating hydrogen from the millions of photoelectrochemical cells that would be needed to produce large quantities of hydrogen. They would not describe the concept in detail pending its publication, except to say that the hydrogen would be generated at a central location.

The Swedish collaboration's investigation of catalysts draws on resident expertise in the mechanisms for proton-coupled electron-transfer reactions that occur in inorganic catalysts and in enzymes such as photosystem II, which participates in photosynthesis in cyanobacteria, algae, and plants. "We make cells but we don't promise to solve the world's problems within the next granting period," says Stenbjörn Styring, the Uppsala University chemist who heads the 75-person consortium. "We study how protons and electrons couple in the very complicated reactions, and we drive the idea that molecular systems have a future in the field."

The consortium has focused on developing water-splitting catalysis based on ruthenium, cobalt oxide, and cobalt-containing molecular complexes. Although ruthenium is expensive, it is "amazingly efficient," Styring says. Citing Nocera's approach, he favors biological pathways for reducing CO_2 to long-carbon-chain fuels. Photosynthetic algae and bacteria can make almost any compound from CO_2, water-derived electrons, and solar energy, he notes.

Atwater mentions another challenge: durability. Rooftop solar panels make economic sense because they will last 25 years. "To date we don't have any demonstration that these relatively efficient water-splitting devices are able to last for more than a few hundred hours." Efforts to improve device lifetimes are under way at JCAP. **David Kramer**

Theory institute opens residence hall for visitors

The aim is for informal interactions to stimulate creativity and collaborations.

PATRICK PRICE

NEW GUEST HOUSING opened in January at the Kavli Institute for Theoretical Physics at the University of California, Santa Barbara.

Visitors to the Kavli Institute for Theoretical Physics (KITP) at the University of California, Santa Barbara, can now lodge together in a sleek new residence hall. Before the hall opened in January, visitors were scattered across town in hotels, rental quarters, and campus housing. The new building is named for Charles T. Munger, who gave $65 million for its construction. Munger is the vice chairman of Berkshire Hathaway, the conglomerate founded by Warren Buffett.

Some 700 visitors come to KITP each year for three weeks or longer, and another 600 come for shorter visits. Roughly half of the visitors come from outside the US. The institute hosts about 10 topical programs each year, on everything from the mysteries of massive stars to the

MICHAEL GRAHAM/UNIVERSITY OF WISCONSIN–MADISON

ON A FRIDAY EVENING IN JANUARY, participants in a program on turbulence hang out in one of the new KITP residence's bar areas.

physics of hearing. Two or three 10- to 12-week programs run simultaneously.

The main goal of the new residence "is to create an environment that allows people to keep interacting day and night and weekends," says KITP director Lars Bildsten. "We expect it to have an impact on collaborations. We wanted to construct a facility that would transform the lives of our visitors."

A couple of kilometers from the main KITP building, the residence can house up to 61 people in single and double units and seven-room suites, each with its own kitchen. There is also a large communal kitchen, a formal drawing room, a children's playroom, exercise rooms, and more. "There is privacy and space to congregate," says Bildsten. And, he says, "there are chalkboards everywhere. Yes, chalk."

Paula Szkody was among the first visitors to stay in the residence. The University of Washington astronomer was there for six weeks for a workshop on magnetohydrodynamics of accretion disks. "We had a couple of gatherings and barbecues," she says, and there was some cross-talk with people from the concurrent workshop on turbulence. "The ambience was great."

"Typically, I spend hours with colleagues in a work environment and don't get to know them outside of work," says Ehsan Moravveji, a postdoc at the Institute of Astronomy at KU Leuven, Belgium. The KITP residence "will enhance communications and let scientists connect and live together outside the academic environment. I find it wise and clever."

As PHYSICS TODAY went to press, Moravveji, who is Iranian, was waiting to see if his visa would come through so he could present an invited talk on massive stars at a conference at KITP in late March. If not, he planned to give his talk from Leuven by either prerecording or live-streaming it over the internet.

Toni Feder PT