# quantum energy and sustainable solar technologies

QESST

NSF/DOE ENGINEERING RESEARCH CENTER

## Industrial Membership Program

# qesst industrial affiliates

The QESST ERC is a NSF/DOE Engineering Research Center whose mission is to:

- enable photovoltaics to meet the "Terawatt Challenge" through collaborative research and development of innovative physical concepts, photovoltaic manufacturing technology, applications, and systems approaches that allow high-efficiency, low-cost photovoltaics;
- develop innovative education approaches that increase public knowledge and acceptance of photovoltaics, which renews interest in science and engineering across a broad spectrum of the public and which support and develop educational opportunities for college students and professions; and
- integrate broader issues surrounding the sustainability of photovoltaics, including policy approaches, lifecycle costing, and material flow analysis, into the development of new photovoltaic technologies.

Lead partner universities of QESST include Arizona State University, California Institute of Technology, Georgia Institute of Technology, Massachusetts Institute of Technology, The University of Arizona, University of Delaware, The University of Houston and The University of New Mexico.

The ERC is formed as a consortium among these universities as well as national laboratories, industrial and other partners who are active participants in accomplishing this mission. Together, our goal is to dramatically improve the efficiency and cost of PV technologies by circumventing the trade-offs between the two. Our focus is on developing innovative approaches to silicon, thin-film and tandem solar cells that are commercially compatible, increase performance and reduce costs. The overall goal is to implement an evolutionary approach to revolutionary technology, where each improvement is compatible with existing production, but, similar to the IC industry, the sum total of the improvements allows performance and cost levels that exceed those predicted today.

**This document is intended to provide an overview of the QESST Industrial Affiliate Membership Program including benefits, costs and some legal considerations. It is not, however, intended to be legal advice.**



**QESST is an Engineering Research Center sponsored by the National Science Foundation (NSF) and U.S. Department of Energy (DOE).**

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 to promote the progress of science; to advance the national health, prosperity and welfare; to secure the national defense.

# member benefits

## STRATEGIC DIRECTION OF THE CENTER

All Industrial Members are able to participate in the Industrial Advisory Board. The Industrial Advisory Board provides strategic review and recommendations to the Center's executive leadership regarding research topics of interest, technology commercialization, system-performance objectives, technology-development roadmaps and overall direction of the Center. The Center Director and executive leadership will consider the recommendations of the Industrial Advisory Board, ensure alignment with the Center's mission and balance the interests of the multiple Industrial Members.

## ACCESS TO PRESENTATIONS, PRE-PUBLICATIONS AND ANNUAL REPORTS

Publications and presentation materials will be shared with Industrial Members, through their IAB representative, at least 30 days prior to any public disclosure. Within that 30 day period, Industrial Members may review the materials and investigate the merits of intellectual property protection. Industrial Members may request a fifteen (15) day delay in the proposed public disclosure to file desired intellectual property protection. In no event will publication or other public disclosure be delayed for more than forty-five (45) days from date of submittal of materials to the Industrial Member for review.

## ACCESS TO FACULTY, INTERNS AND LAB FACILITIES

The Center expects to conduct research with seven other universities including Caltech, MIT, University of Delaware, The University of New Mexico, Georgia Institute of Technology, The University of Arizona and The University of Houston. With access to faculty, interns and lab facilities at eight universities, the Center will have the opportunity to conduct its research projects at world-class research institutions.

| | Partner Member $100K | General Member $50K | Affiliate Member $25K |
|---|---|---|---|
| Access to presentations, pre-publications, annual reports | ✓ | ✓ | ✓ |
| Access to faculty, interns and university lab facilities* | ✓ | ✓ | ✓ |
| Visiting Industry Fellows program* | ✓ | ✓ | |
| Non-exclusive, royalty-free IP license rights | ✓ | ✓ | |
| One day company-specific PV educational workshops | | ✓ | |
| One to three day company-specific PV educational workshops | ✓ | | |
| Collaborative graduate student for nine months, 20 hours per week | | ✓ | |
| Collaborative postdoctoral student for nine months, 40 hours per week | ✓ | | |

*fees may apply

Arizona State University · Massachusetts Institute of Technology · University of Delaware · Caltech · The University of New Mexico

## VISITING SCIENTIST PROGRAM

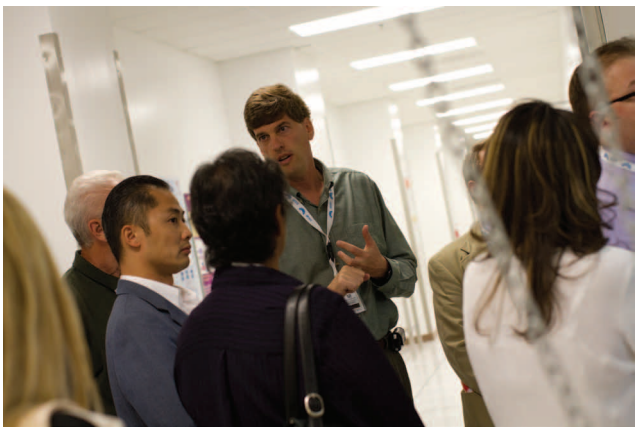
The Center will endeavor to create a Visiting Industrial Fellows (VIF) program to bring industrial fellows and university researchers together in a collaborative interaction. Any visiting industry fellowships shall be according to a separate agreement between the Member and the hosting institution and shall require any visiting industry fellow to abide by all policies and procedures of the hosting institution.

## INTELLECTUAL PROPERTY

- Intellectual property shall be owned by the Academic Member from where the research giving rise to the intellectual property (IP) was performed
- All Partner and General Members have the option to receive perpetual, royalty-free, non-exclusive commercialization license rights to intellectual property developed during their membership in the Center
- All Partner or General Members electing to exercise their option must equally share the cost of pursuing and maintaining intellectual property protection
- Partner and General Members will be given 60 days to confirm their intention to pursue their IP rights
- Partner or General Members can negotiate for exclusivity or limited exclusivity to IP with consent of the other Partner, General, and the title-holding Academic Members
- All members of the Center are allowed to utilize, for research purposes, Center-derived Academic Member IP
- Member participation in the ERC has no effect on Members' background IP rights

## SBIR OPPORTUNITIES

ASU has a focused SBIR program that helps train and connect small businesses with large corporate prime contractors, providing commercialization input and advice. Through the Industrial Liaison Office, Industrial Members of the Center can participate in this program.



**Preliminary—This document is currently in the review/ approval process within the ERC Academic Institutions and is subject to modification.**

## COMPANY-SPECIFIC PV EDUCATIONAL WORKSHOPS

The Center will develop long-term professional development relationships with industry partners. We understand that in addition to access to well-trained students, our industry partners need to provide their current employees with training and professional development in topics that will allow them to take advantage of cutting-edge silicon solar cell technology, models for sustainable technology development, concentrated photovoltaics and a host of other technologies.

Industrial Members have the opportunity to develop long-term relationships with educational researchers and trainers. This relationship will enable the Center to provide efficient, tailored professional development workshops and quality assessment. This relationship allows for the following benefits:

- Work with specific department representatives to develop annual goals for professional development.
- Develop assessment tools specifically tailored to the professional development goals which will allow for the most efficient professional development training.
- Access Web tools for assessment and just-in-time instruction.
- Training for small (five) or large (20) groups.

## ALLOCATION OF GRADUATE STUDENT AND POSTDOCTORAL RESEARCHERS

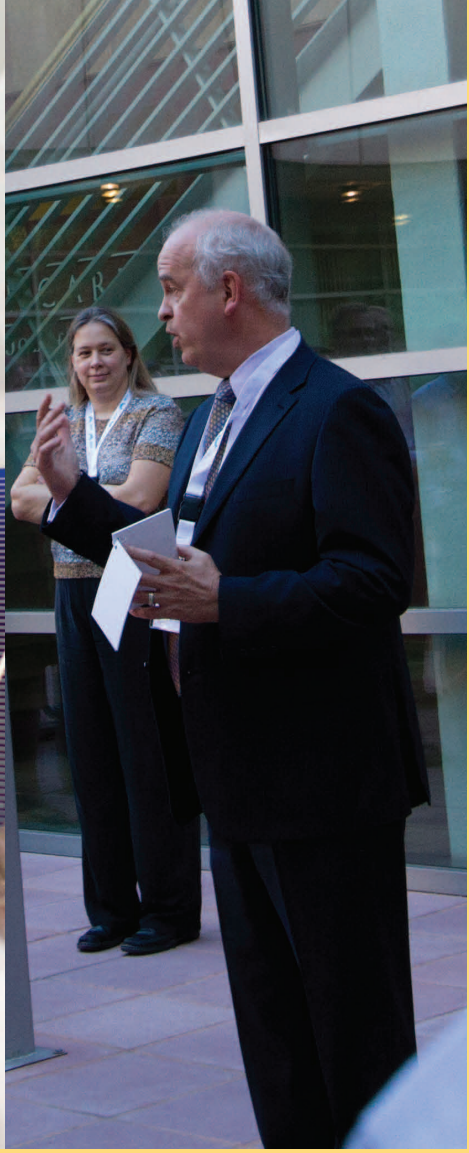
The Center will conduct research with the assistance of master's degree candidates, doctoral degree candidates and postdoctoral researchers. Masters and doctoral students are required to work a maximum of 20 hours per week. Postdoctoral researchers can work a traditional 40 hour work week and are expected to remain in the Center for a period of two years.

When the Center assigns research projects to students and postdoctoral researchers, it will attempt to create a balance between membership contribution levels, research interests, mission of the Center and overall benefit to the Industrial Member.

東京大学 THE UNIVERSITY OF TOKYO

UNSW

Imperial College London



## QESST is revolutionizing energy for the world.

Electricity is the lifeblood of modern society—powering everything from cities to pacemakers—and the demand for electricity continues to grow. The electricity generation system faces challenges: harmful environmental impacts; the lack of access to electricity for over one-quarter of the world's population; threats to national security; resource-supply problems; and difficulty in powering autonomous applications. A new system for supplying electricity is needed. QESST is transforming the existing electricity generation system, making it sustainable, ubiquitous and multifunctional by developing photovoltaic and quantum energy converters that fundamentally alter how energy is used.

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