

2016 Annual Site Visit





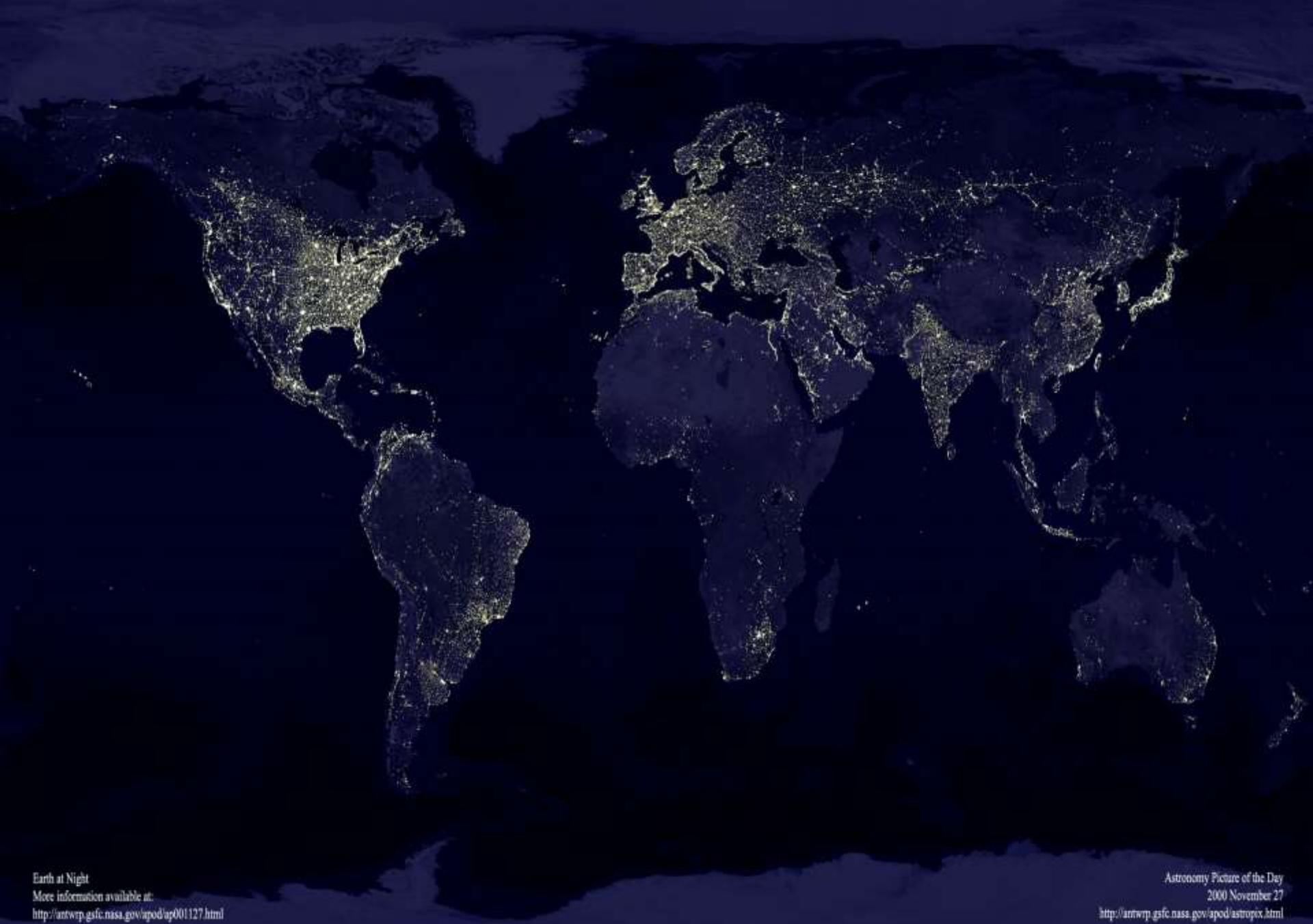
Quantum
Energy and
Sustainable
Solar
Technologies

Industrial Membership Program and Innovation Model

John J Mitchell

Industry Liaison Officer

Arizona State University



Earth at Night
More information available at:
<http://anrwp.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day
2000 November 27
<http://anrwp.gsfc.nasa.gov/apod/astropix.html>

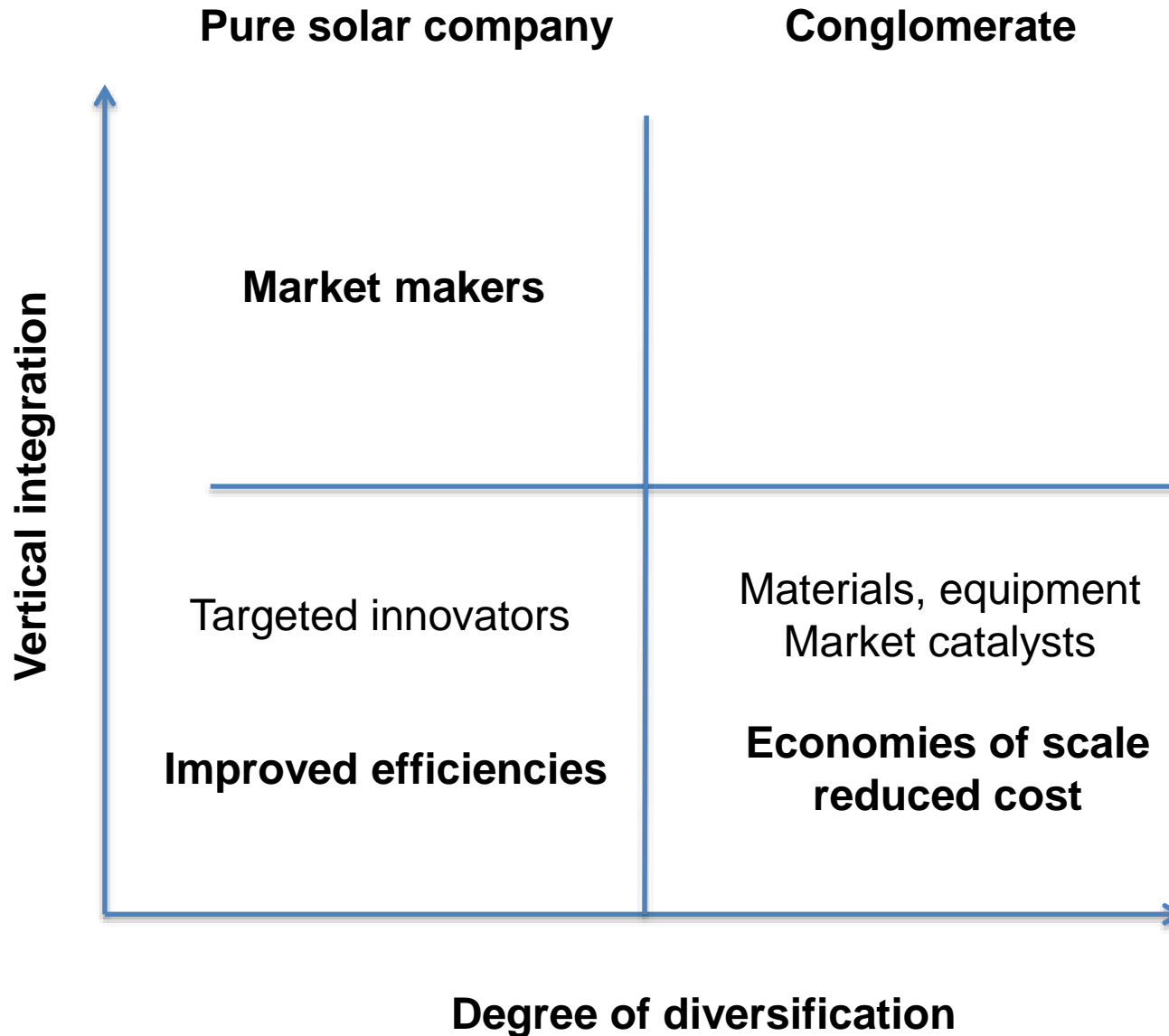
A world map where the landmasses are dark, and the city lights are shown as bright yellow and white dots, primarily concentrated in North America, Europe, and East Asia. The background is a deep blue/black color.

Help address the Terawatt Challenge

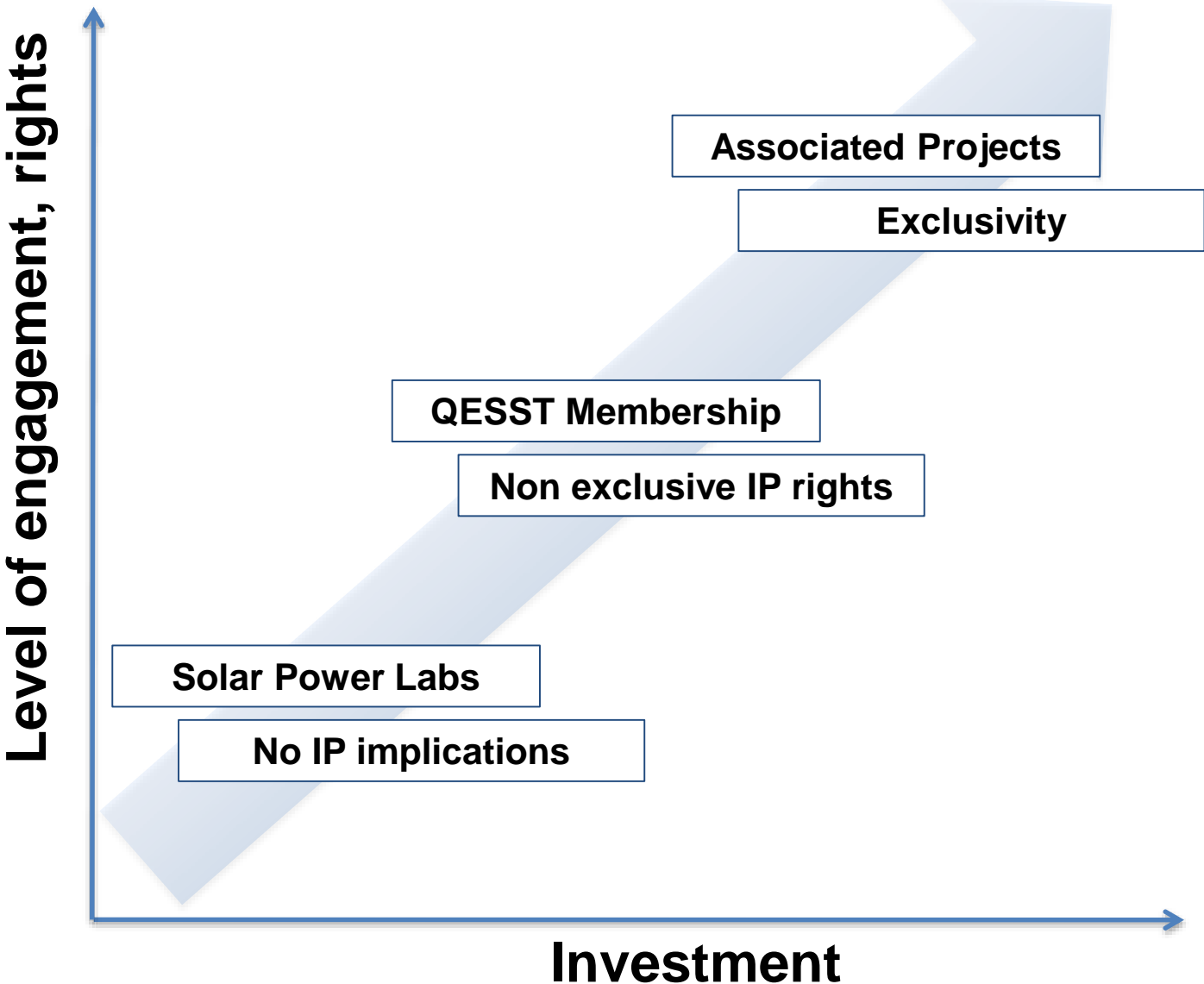
Reducing costs
Improving efficiency

1.5 Billion people in the dark (21%)

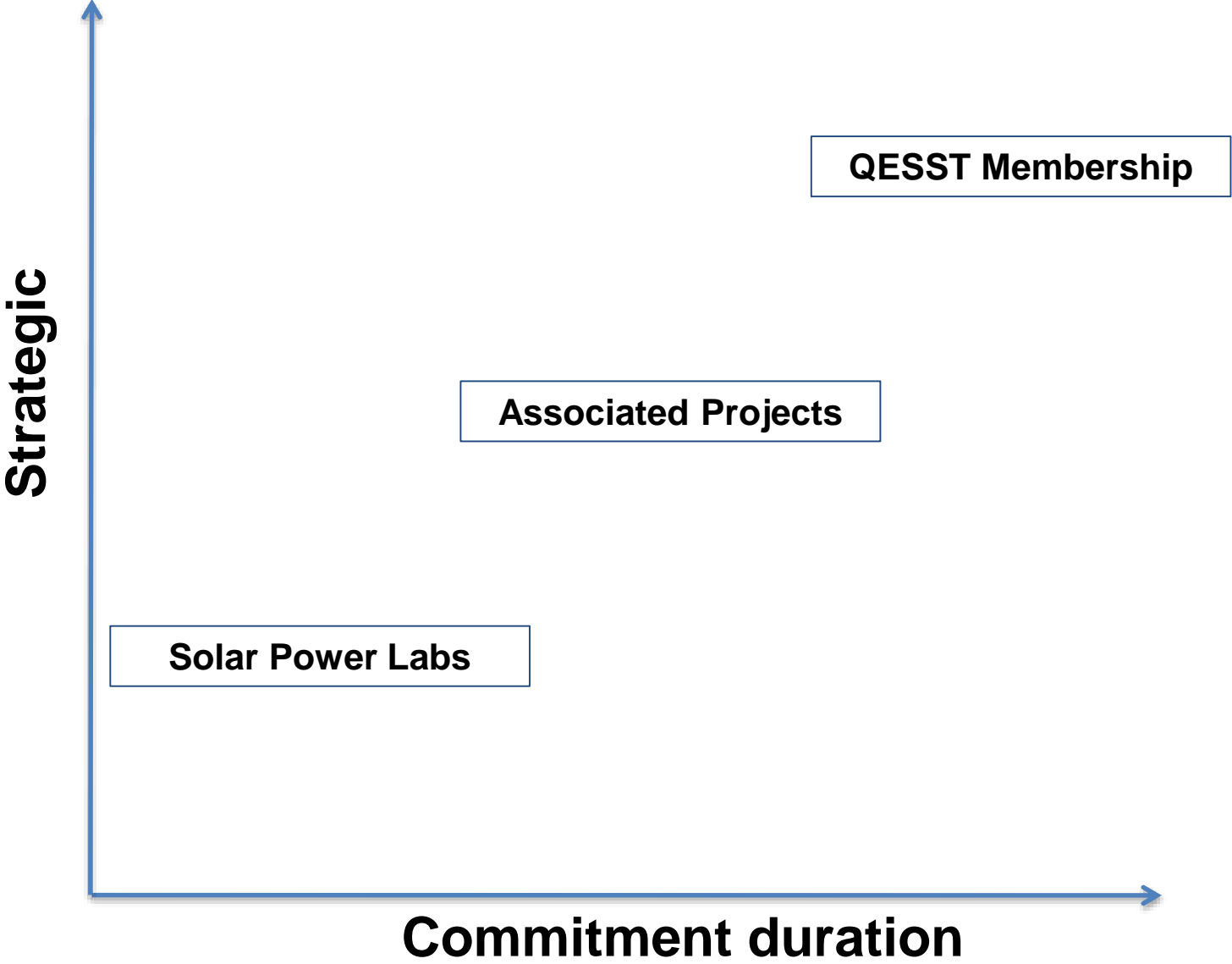
Industry engagement strategy



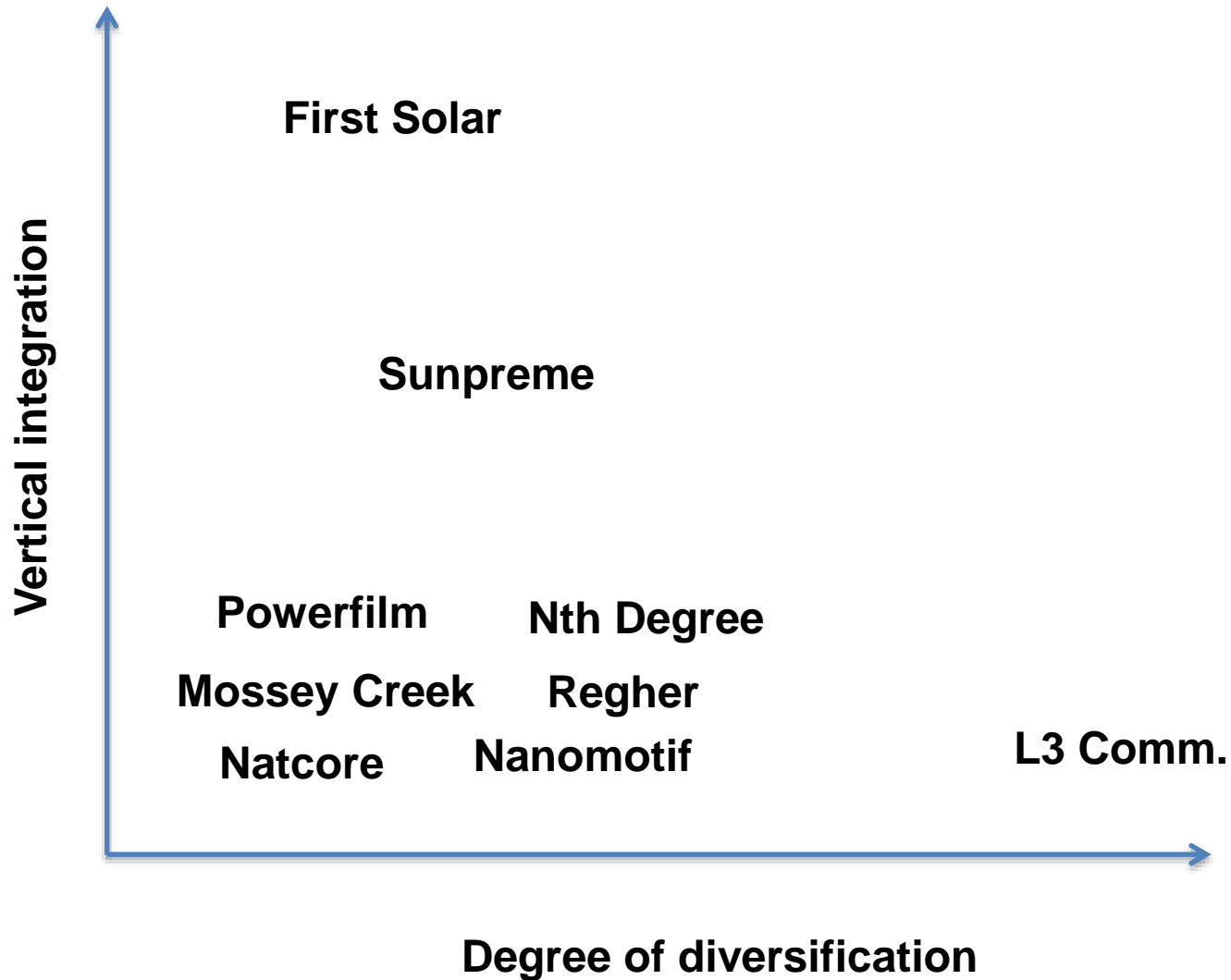
Industry engagement



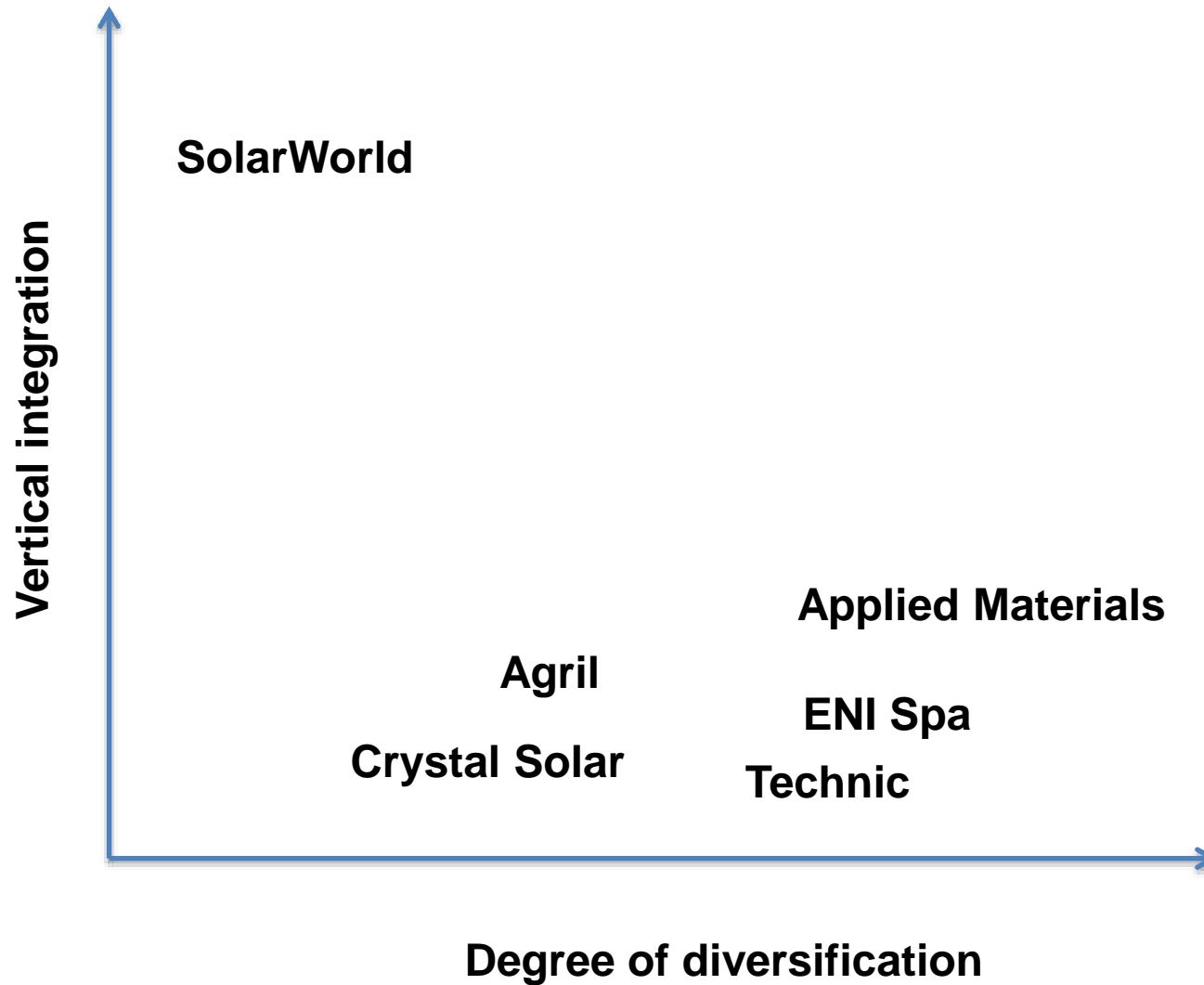
Industry engagement



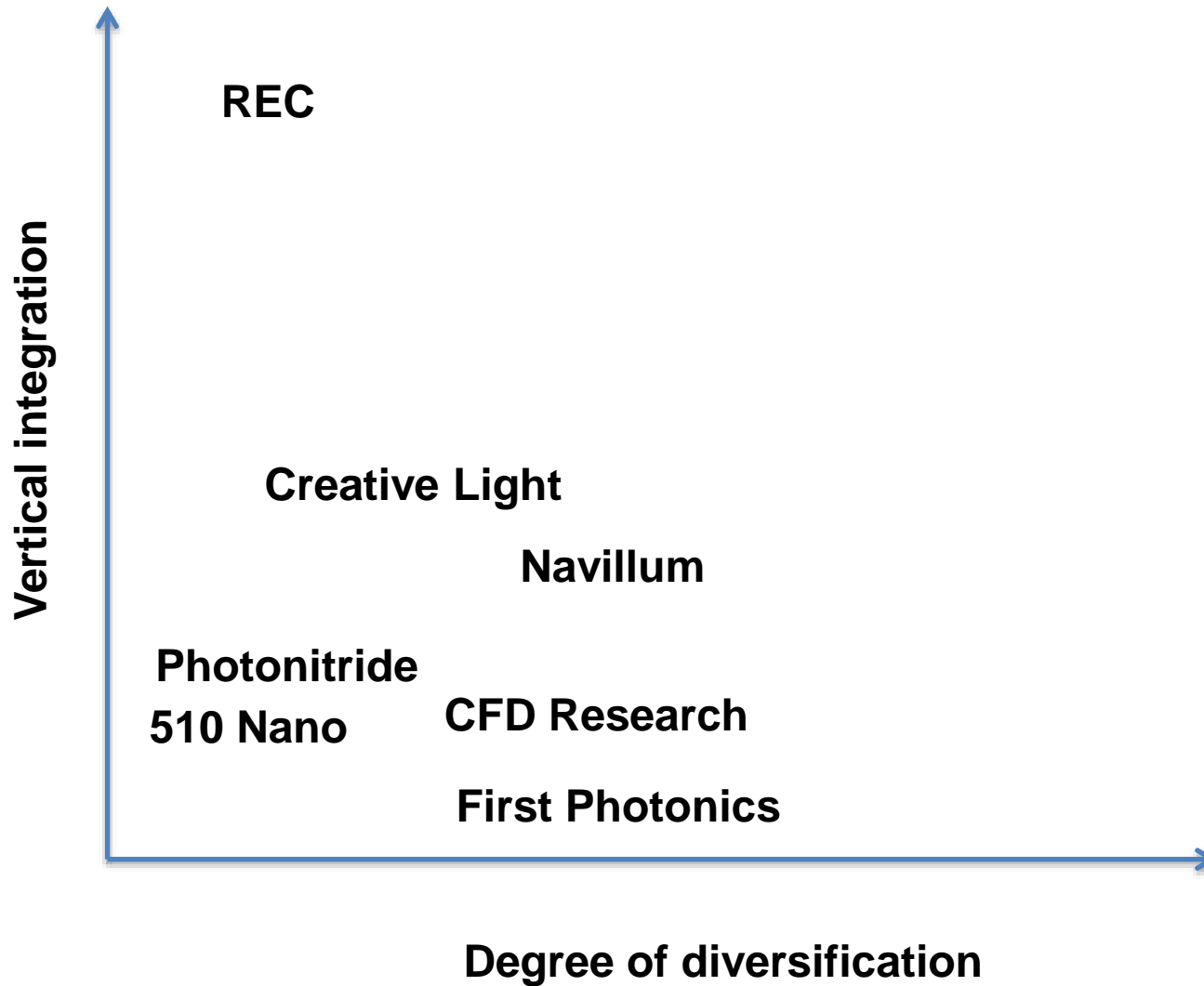
Year 5 Solar Power Lab Recharge Center



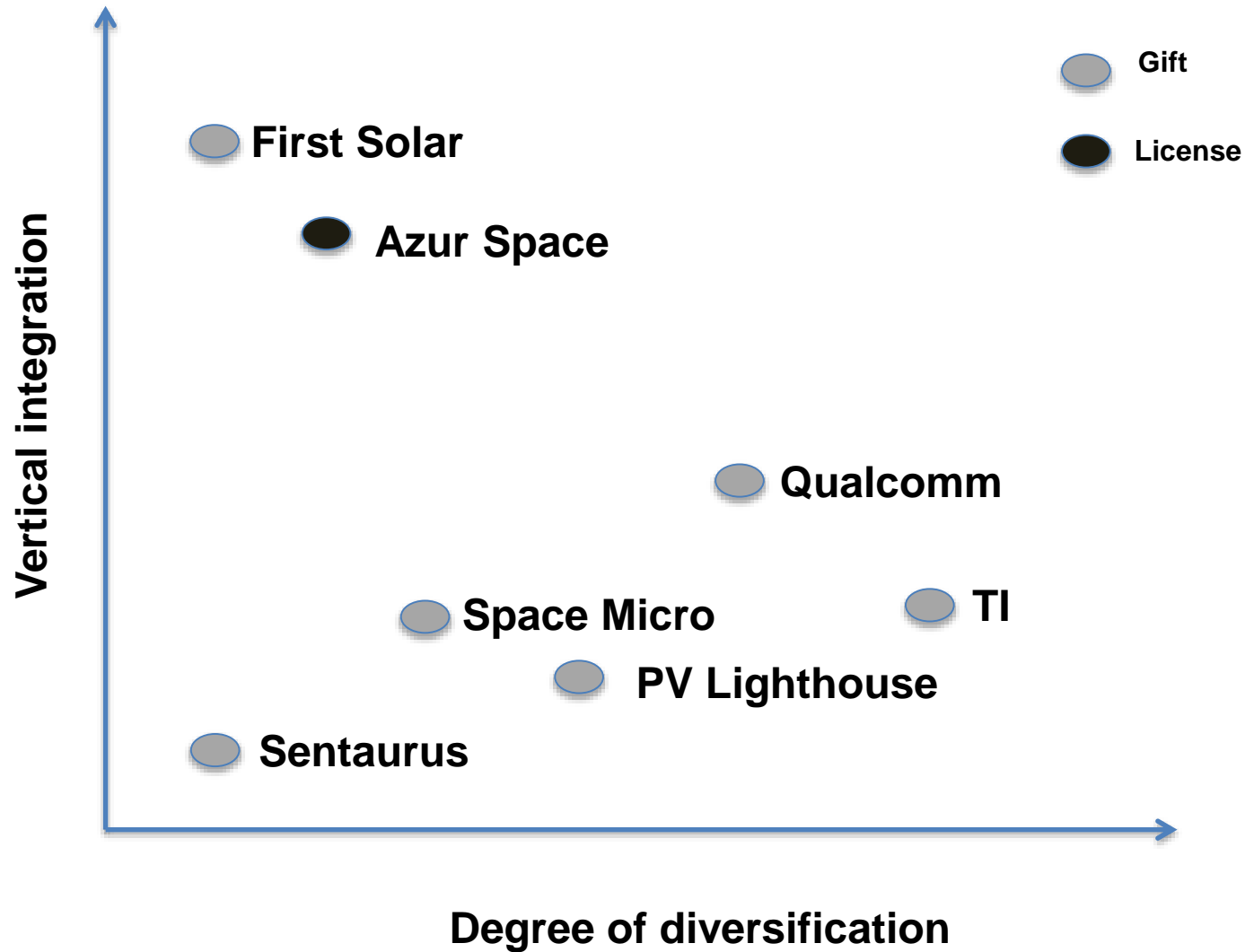
Year 5 associated industry projects



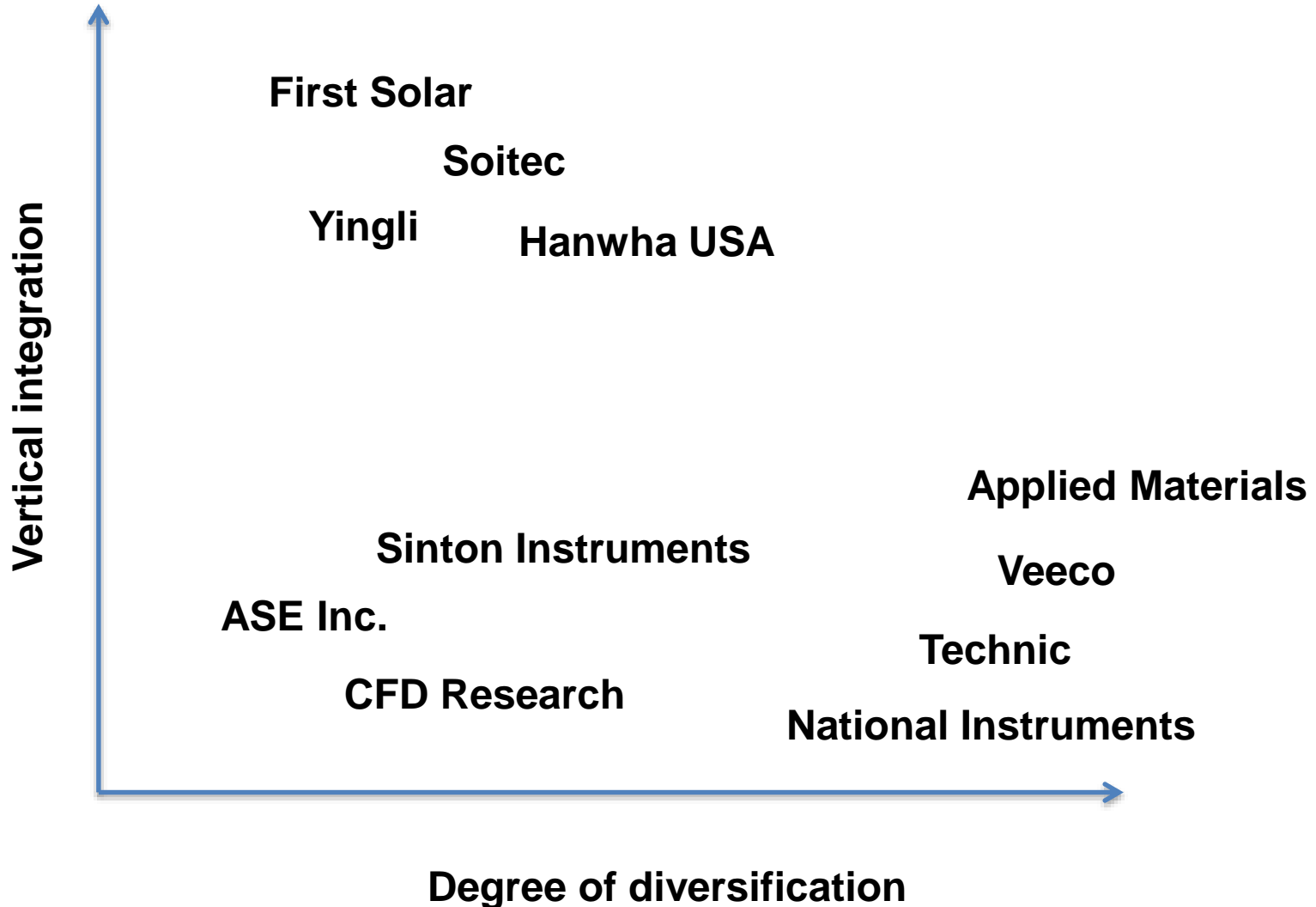
Year 5 grant partners



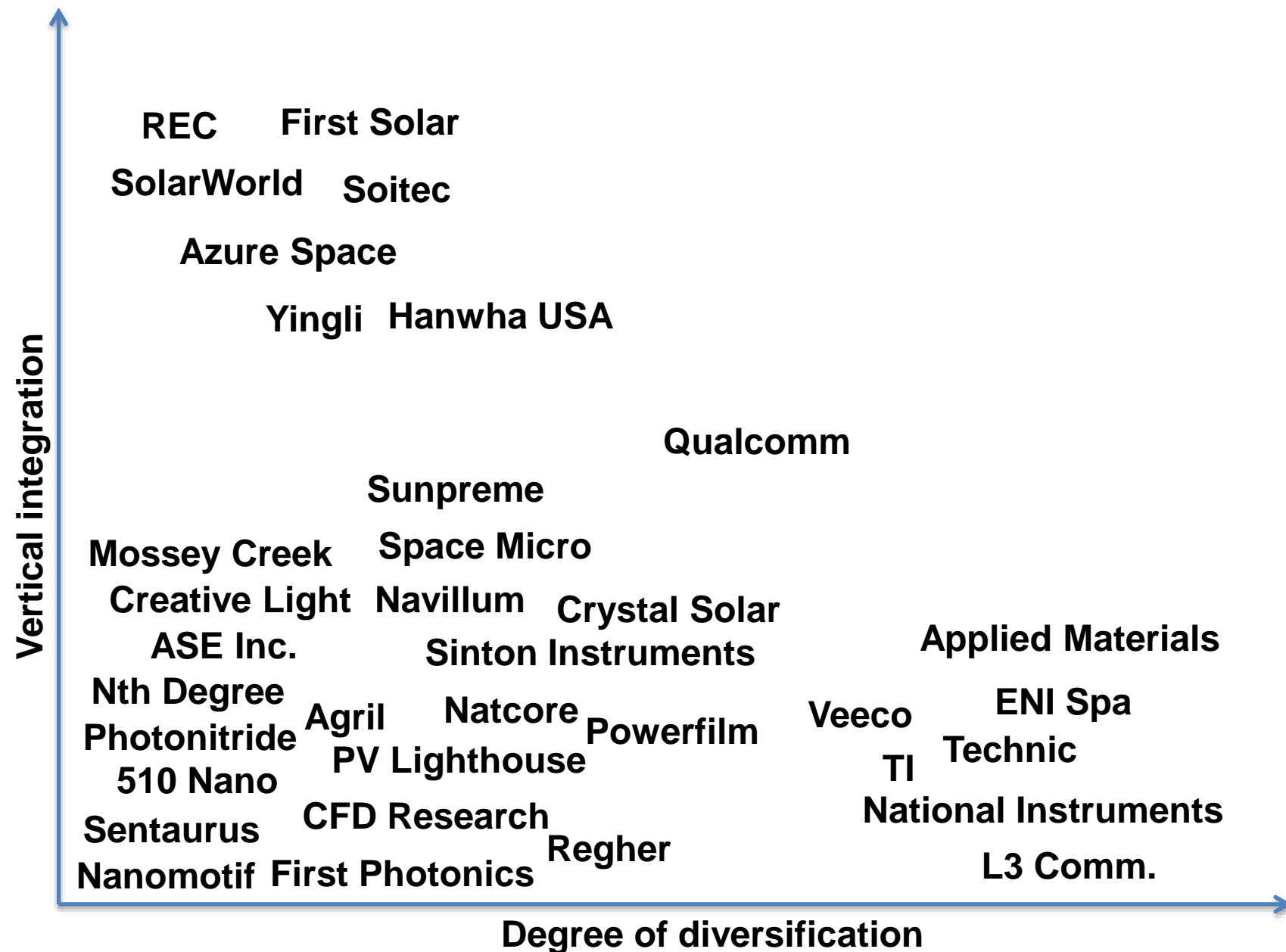
Other affiliated companies



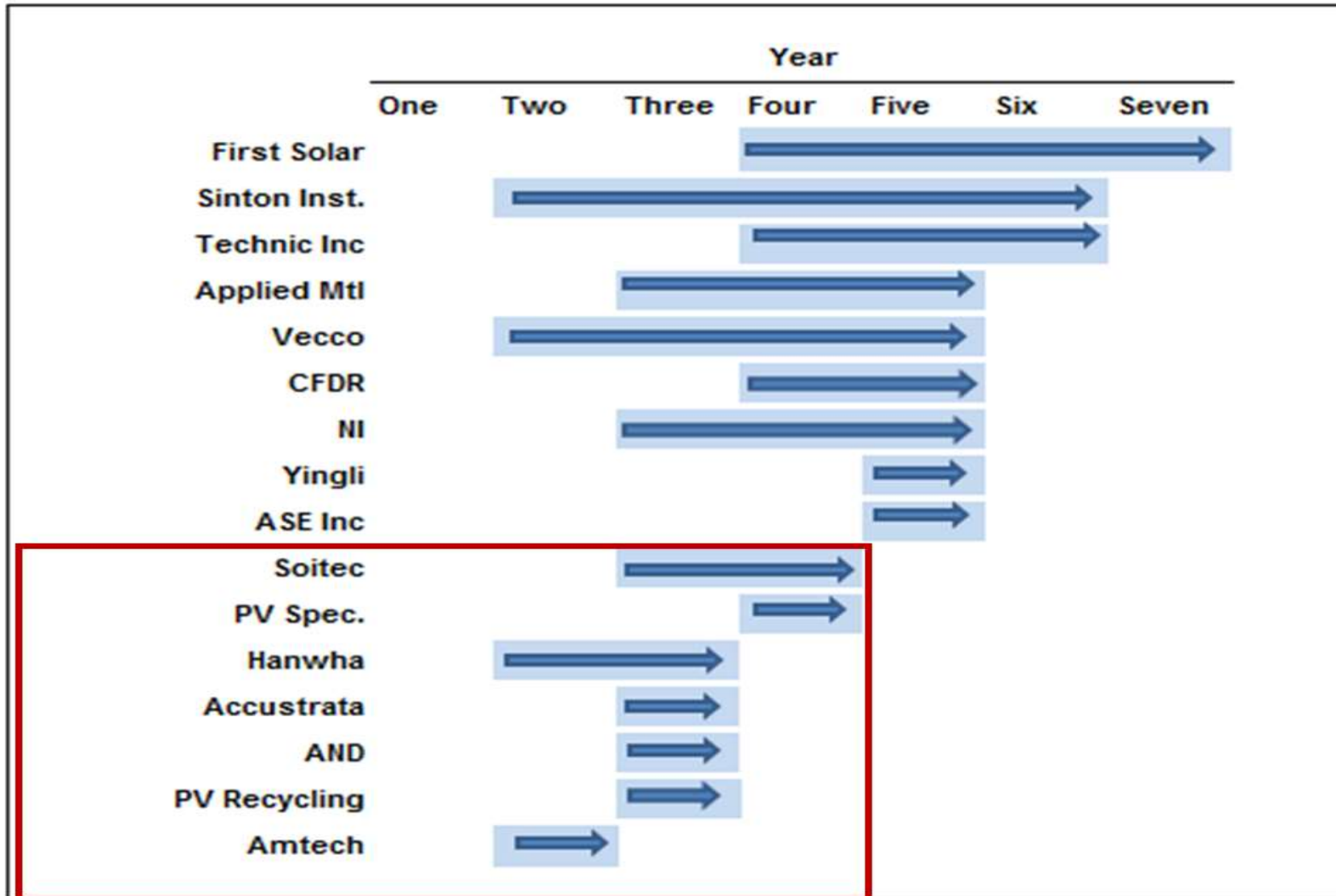
Year 5 QESST Industry Members



Year 5 industry partners combined (35)



Membership trends



QESST Industry Members

Characterized by

- strategic alignment with QESST
- longer term commitments
- multi-faceted



Member engagement

Sustainability and CdTe projects

Four year commitment

Co-author papers

Donated 1000 modules
Series 4™ PV Modules

Solar Energy Engineering & Commercialization

Advisory Board member

20+ alumni from the program



Dr. Vasileska
QESST Faculty



Dwarak Rav.
QESST Scholar



Member engagement

Chair the IAB

Partnered on DoE grant

low cost silicon

Multiple internships and hires

Customer to a QESST spinout

Multi-year commitment in process



Tim Reblitz
QESST Scholar



Member engagement

Partnered on DoE grant



High Efficiency Low Cost Tandem Solar Cells

Multiple internships

Research across facilities (ASU and Veeco)

Co-author on papers



Chaomin Zhang
QESST Scholar



Yeongho Kim
QESST Scholar



Member engagement

First IAB Member



Simone Bernardini
QESST Scholar

Multi-year commitment

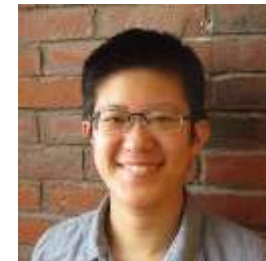


Mallory Jensen
MIT QESST Scholar

Multiple donations of equipment

Academic collaboration on 5 projects

Mentoring QESST Scholars



Ashley Morishige
MIT QESST Scholar

Silicon workshop

Lab access to QESST Scholars

Member engagement



Three year commitment

Associated projects

Partner on DoE grant

Silver free metallization

Plating tools installed in QESST labs



Joe Karas
QESST Scholar



Member engagement



Certification training for over ~60 students

NI technology embedded in the Holman Lab

International development projects – HEEAP

Trained over 250 faculty from 8 universities



Member engagement



AddVenture Support Enterprises, Inc.

- Business & Technology development
- Angel investors

Sponsored research at Georgia Tech

Student and project mentoring



Soo Chin
Principal, ASE



Chloe Fabian
GT QESST Scholar



Member engagement



Mallory Jensen
MIT QESST Scholar

SBIR/STTRs

NASA solar cells for space arrays

DTRA distributed radiation sensors – Phase II

Joint proposal with University of Houston

Student mentoring with Mallory Jensen (MIT)

Member engagement



QESST supporting CFDRC's incubator

Based on I-Corps Program

Learnings from Perfect Pitch

Co-locating at the ASU SkySong campus



Funding model – SECO wins



Spin-out companies

SunShot proposals

SECO proposals

Joint SBIR/STTR proposals

Quarterly grant writing workshops

ARGIL, INC.

Where are they now



Eva Pettinato
Aerospace Engineer at Orbital ATK
Phoenix, Arizona Area | Aviation & Aerospace
Current: Orbital ATK, Self-Employed
Previous: Arizona State University, Arizona Science Center, Envy
Education: Arizona State University - Ira A. Fulton Schools of Engineering

Send a message Endorse



Akhil Mehrotra
Process Engineer at Applied Materials
Sunnyvale, California | Semiconductors
Previous: University of Houston
Education: University of Houston

Send a message Endorse



Guy Pickett
Process Engineer at Alta Devices
San Francisco Bay Area | Higher Education
Previous: Arizona State University, Applied Materials, United States Marine Corps
Education: Arizona State University

Send a message Endorse



Carrie Culp
Engineer II Expansion Planning at MISO
Greater New Orleans Area | Utilities
Current: MISO
Previous: Arizona State University, QESST, Midwest ISO
Education: Arizona State University



Priyaranga Koswatta
Research Assistant
Tempe, Arizona | Semiconductors
Current: Arizona State University
Previous: Applied Materials, Sri Lanka Institute of Information Technology, Purdue University
Education: Arizona State University

Send a message



Jim Reblitz
Application Engineer at Applied Materials
Tempe, Arizona | Semiconductors
Current: Applied Materials, Teclac Engineering
Previous: Arizona State University, Applied Materials, Direct Alliance
Education: Arizona State University

Send a message Endorse



Chloe Fabien
Nanomaterials and Vacuum
Greater Seattle Area | Nanotechnology
Previous: Georgia Institute of Technology
Education: Georgia Institute of Technology

Send a message Endorse



Junli Li
DER Consultant at ICF International
Washington D.C. Metro Area | Oil & Energy
Current: ICF International, Mid-Atlantic Industrial Assessment Center
Previous: Environmental Defense Fund, Center for Energy and Environmental Policy, University of Delaware, Foundation for Renewable Energy and Environment
Education: University of Delaware

Send a message Endorse



Juan Manuel
Research Scientist at Lumintec
Tucson, Arizona Area | Research
Previous: The University of Arizona, Princeton University
Education: University of Arizona



Shi Liu
Process TD engineer
Hillsboro, Oregon | Electrical/Electronic Manufacturing
Current: Intel Corporation
Previous: Arizona State University



Nicole Kotulak
NRC Postdoctoral Associate at Naval Research Laboratory
Washington, D.C. Metro Area | Research
Previous: University of Michigan
Education: University of Michigan

Send a message



Vivek Sharma
PTD Thin Film Module Engineer at Intel Corporation
Hillsboro, Oregon | Semiconductors
Previous: Solar Power Lab, Arizona State University, TUM, Photovoltaic Testing Lab (PTL), NREL, Inc.
Education: Arizona State University

Send a message Endorse



Matthew Erdman
Graduate Technical Intern at Sandia National Laboratories
Rio Rancho, New Mexico | Semiconductors
Current: Sandia National Laboratories, University of New Mexico
Previous: Arizona State University, 310 Solar LLC
Education: The University of New Mexico

Send a message Endorse



Sergio Castellanos
Energy Fellow at Berkeley Energy & Climate and ITESM
San Francisco Bay Area | Renewables & Environment
Current: Berkeley Energy & Climate Institute - ITESM
Previous: Massachusetts Institute of Technology (MIT), Se Energia (SENER) - Mexican Secretariat of Energy Architects & Engineers, Inc.
Education: Massachusetts Institute of Technology



Stephanie Scott
Mechanical Design Engineer at Apple
San Francisco Bay Area | Mechanical or Industrial Engineering
Previous: MIT, PARC, CARES Project (Community Assessment Renewable Energy & Sustainability)
Education: MIT

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Prateek Garg
Electrical Engineer specializing in Solid State Devices
Hillsboro, Oregon | Electrical/Electronic Manufacturing
Current: Intel Corporation
Previous: Arizona State University, Qualcomm, Jawaharlal Nehru Centre for Advanced Scientific Research
Education: Arizona State University

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Ben Wender
STAR Fellow at US EPA
(EPA)
Tempe, Arizona | Higher Education



Hal Emmer
Senior Process Engineer at Maxim Integrated
Greater Los Angeles Area | Electrical/Electronic Manufacturing
Education: California Institute of Technology

Send a message Endorse



Shelby Vorndran
Intern at Edmund Optics
Tucson, Arizona Area | Renewables & Environment
Current: Photon Engineering, LLC, The University of Arizona, College of Optical Sciences
Previous: Edmund Optics, University of California, Los Angeles, DePaul University
Education: University of Arizona

Send a message Endorse

Where are they now in industry

Solar

Alta Devices

First Solar

Gehrlicher Solar

Global Solar Energy

OCI Solar Power

DEPCOM Power

Modern Electron

SunPower

Sunprime

Solexel

1366 Technology

SolarWorld

Sinton Instruments

Trina Solar

Solar City

Semiconductor

Intel

ON Semiconductor

Maxim Integrated

Optics

Luminit

Photon Engineering

Edmond Optics

Laser Components

Agril

Governmental agency

Sandia

Naval Research Labs

Other

L3 Communications

Omnivision

Orbital ATK

Apple

Materials

Applied Materials

Air Liquide

Heraeus

DuPont

Utility

MISO Energy

SRP

Consulting

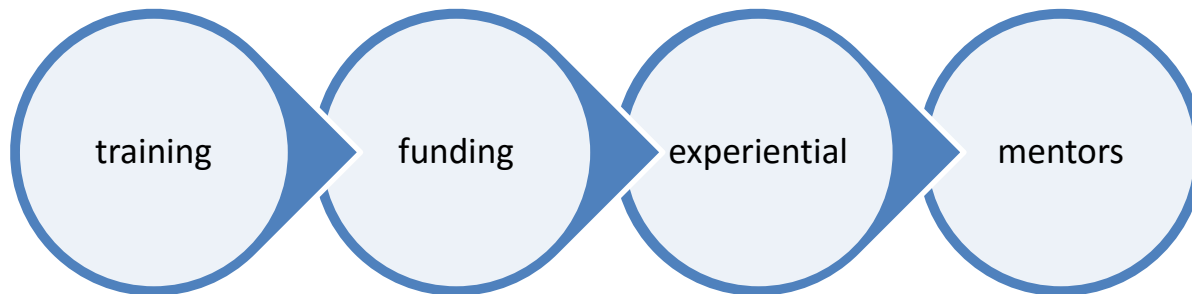
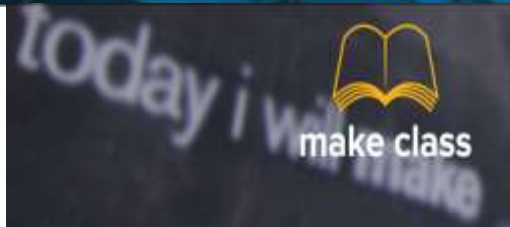
Synapse

ICF International

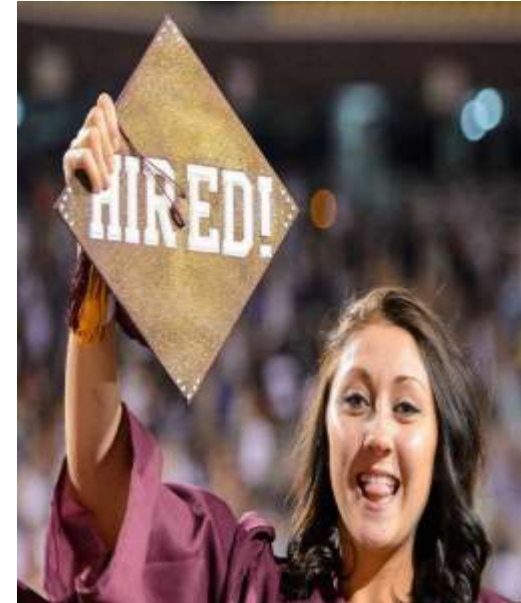




Innovation resources



Student Leadership Council driven



Salary negotiations workshop

Mock interviews

Budget writing workshop



Recent results



Priyaranga Koswatta
QESST Scholar

“John provided me with very valuable strategic guidance in terms of long range career planning, tactical job search techniques, interviewing practice, salary negotiations and general moral support. I am very thankful to him for lending his experience and guidance to me.”

April 17, 2016



Startups



Regher LLC - postdoc

Proximo Solar - postdoc

First Photonics – UNM faculty



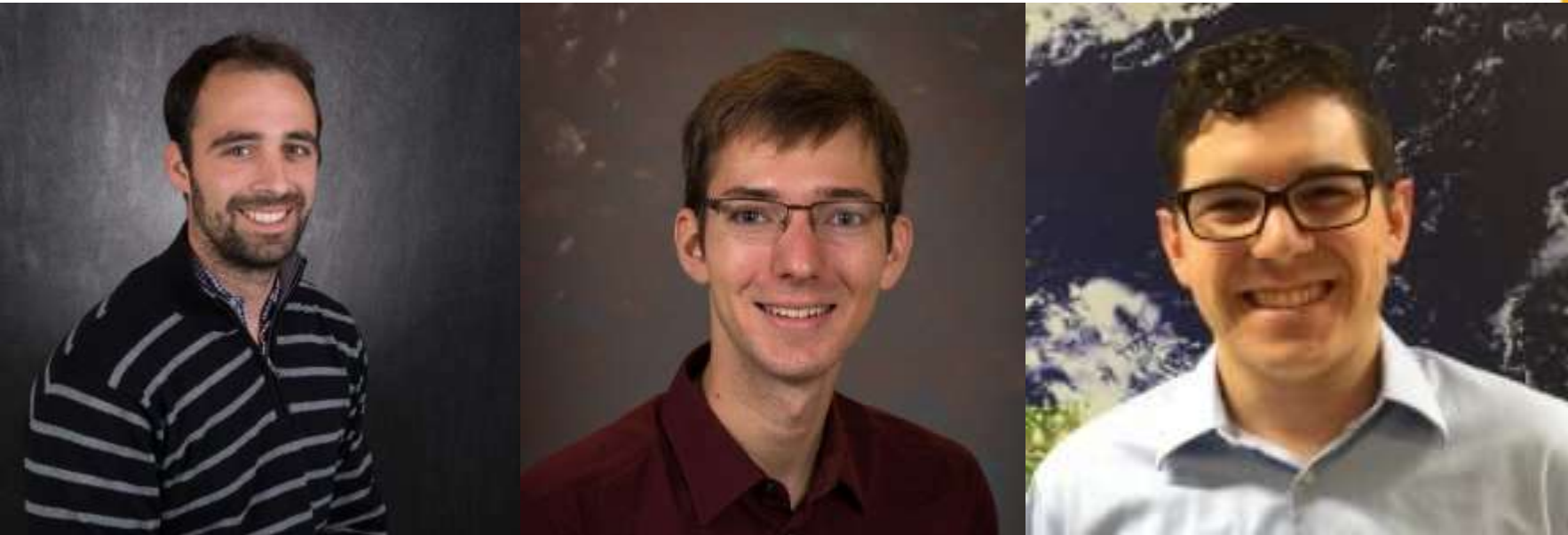
TreeBlitz Engineering – PhD candidate

Innovative Advanced Materials Inc. – GT faculty

Innovative Advanced Technologies LLC – GT faculty



QESST Perfect Pitch Winner



1st place

Pablo Guimera Coll - ASU

2nd place

Jimmy Hack - UDEL

3rd place

Cristofer Flowers, CalTech



Selected by QESST Industry Advisory Board

Less than 1 point between 1st and 3rd place

National Perfect Pitch Winner



Competition amongst 19 ERCs across the country



Perfect Pitch Winner to Rock star



Radio interview



Headline news



Letter from the mayor



Buenos Dias Canarias

da

Diario de Avisos.com

DECANO DE LA PRENSA DE CANARIAS



**PABLO
GUIMERÁ COLL**
CIENTÍFICO
TINERFERO

Este orotavense de 28 años ganó un importante concurso científico en Estados Unidos con una investigación sobre energía solar que permitirá reducir los gastos de producción de los paneles en el 30%.



del año con 50 actuaciones y la participación de más de 40 bailarines.

horas, en el campo de fútbol municipal de Garachico.



**HASSAN SHEIKH
MOHAMUD**
PRESIDENTE
DE SOMALIA

El Gobierno de Somalia, en el colmo de la intransigencia, ha prohibido la Navidad en el país por creer que "esta festividad es contraria a la cultura islámica y podría dañar la fe de la comunidad musulmana".

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Thank you



For the Impact



Backup slides



Value Proposition - Industry

- Access faculty, student, industry peers, **know-how**
- Access **to lab resources**
- Investigate **gaps in technology roadmaps**



Value Proposition - Industry

Workforce development

- Longest interviewing process in the country
- Training future scientists



Value Proposition - Industry

Workforce development

- The cost for one bad hire
\$140,000 – Bad hire calculator
ADP



Value Proposition - Industry

- Financial leverage
 - NSF, DoE core funding
 - Reduced F&A rates



Value Proposition - Industry

Use QESST research to position your company for other opportunities



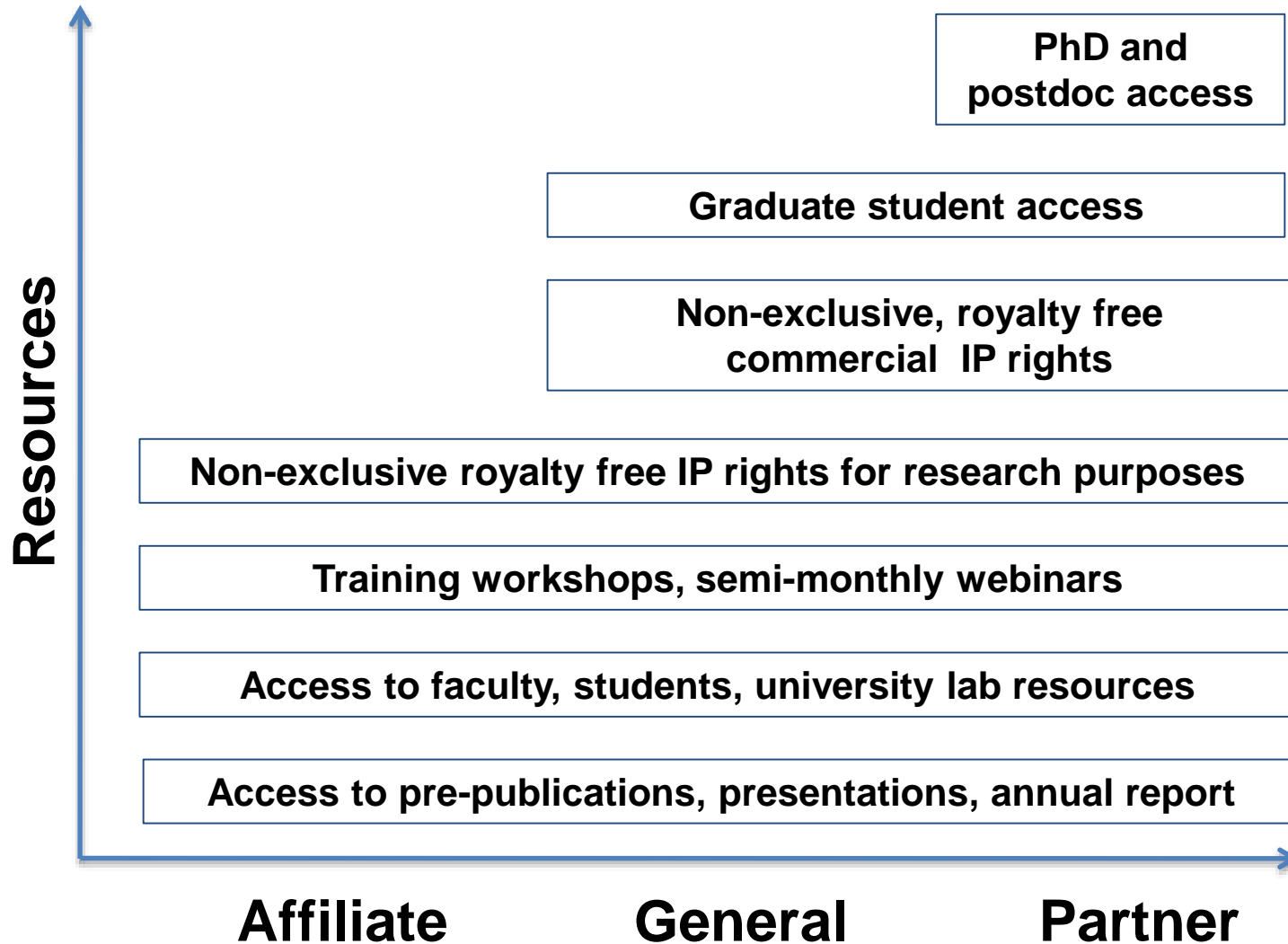
Access to the ASU library with thousands of journals and publications

Value Proposition - Industry

One straight forward agreement provides IP rights to all QESST universities



Industrial Membership Structure



Startups



Regher LLC

Stanislav

Gerasimenko – “Stas”

- 1 patent issued and one pending
- 2 SunShot Incubator proposal,



Proximo Solar LLC

James LeBeau

- High-powered laser processing technique (laser wafering) to reduce kerf loss
- Patent pending

Startups



First Photonics
Ganesh Balakrishnan
Funding from
Cottonwood venture funds
UNM gap fund
Collaborating with NREL.



Reblitz Engineering
Software startup
Silicon Solar Device Fabrication
& Characterization
Business Process Engineering



Startups



Innovative Advanced
Materials Inc.



Innovative Advanced
Technologies LLC



Marketing QESST

- Faculty and students presenting at conferences
- ILO attending conferences
- LinkedIn
- Google alerts
- Direct marketing



Communication with Industry Members

Semi-monthly webinars

Semi-annual advisory board meetings

Workshops

Annual report

Annual review

Newsletter

**One-one direct communications
(customized)**



Industry Calendar

Activities

J A S O N D J F M A M J

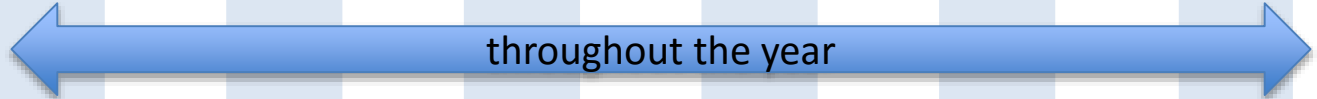
Industry Advisory Board Meeting



Annual site visit



1-1 meetings with individual members



IAB ranks faculty project proposals



Mentor project review



Vidyo series 1st and 3rd Monday of each month



PVSC Conference – student, industry luncheon

