

SERIIUS

Solar Energy Research Institute
for India and the United States

The Solar Energy Research Institute for India and the United States (SERIIUS) creates a bi-national network for fostering new ideas and collaborations to expedite a sustainable industry. SERIIUS is developing disruptive technologies through foundational research in photovoltaics (PV) and concentrating solar power (CSP) to address the critical barriers for solar energy development in India that intersect the grand challenges for solar energy in the U.S.

Vision

SERIIUS seeks to create an environment for cooperation and innovation “without borders,” to develop and ready emerging revolutionary solar electricity technologies toward the long-term success of India’s *Jawaharlal Nehru Solar National Energy Mission* and the U.S. Department of Energy (DOE) *SunShot Initiative*.

Focus

SERIIUS is carrying out fundamental and applied research, analysis and assessment, outreach, and workforce development through specific bi-national projects in three Research Thrusts:

Sustainable Photovoltaics: To develop next-generation materials, devices, and advanced manufacturing processes tailored to the needs, environment, and resource availability of India and the US.

Multiscale Concentrated Solar Power: To overcome critical science and engineering challenges for reliable multiscale (including small 25–500 kW) CSP systems.

Solar Energy Integration: To identify and assess key technical, economic, environmental, and policy barriers, enabling a research agenda for technical readiness in India and to benefit the U.S.

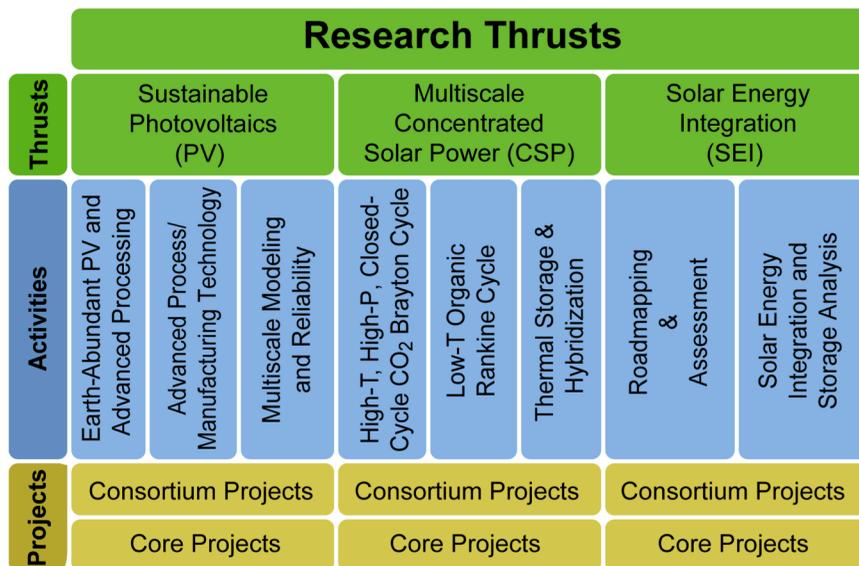


Key objectives of SERIIUS are to:

- Perform high-impact R&D, analysis, and assessment in PV, CSP, and solar energy integration (SEI)
- Identify and quantify critical technical, economic, and policy issues for solar energy development/deployment in India
- Establish collaborative project structure and joint intellectual property management
- Cultivate effective bi-national collaboration, including collaborative culture and outreach
- Develop a vibrant solar workforce for the future.



Research Strategy



Each **Activity** in a **Thrust** comprises:

- **Consortium Projects** that are higher risk, pre-competitive disruptive or transformative R&D, and
- **Core Projects** that are led by core industrial partners and focus on specific technical issues identified by industry. Core industry partners provide cost share for enhancing Consortium research efforts.

SERIIUS is serious about working with you to expand our R&D

For **research organizations**, if our Consortium research projects align with yours, then let's consider working together to strengthen both our efforts.

For **industry groups**, we think that SERIIUS has the value proposition to bolster your bottom line. We want to partner with you—from fundamental research expertise for improving your products to roadmapping, technology/policy assessment, and reliability analysis and testing—to leverage your success in the India and U.S. markets.

Why SERIIUS and this Team

The Consortium is co-led by the Indian Institute of Science-Bangalore and the National Renewable Energy Laboratory and facilitates joint R&D and related activities on clean energy—by teams of some 160 scientists, technologists, and engineers from India and the U.S.—needed to deploy clean energy technologies rapidly with the greatest impact. We have:

- **Critical mass** of expertise with knowledge in all aspects of the problem.
- **World-recognized and integrated international technical team**, with outstanding backgrounds in solar PV and CSP technologies—backed by an accomplished solar integration effort for analysis, assessment, and roadmapping.
- The ability and dedication to **accelerate the development of new solar technologies** and their adaption to the Indian markets, with reverse penetration to the U.S. market.

SERIIUS' Value Proposition for Industry and Academia

Benefits	Features of Joining the Consortium
Expanding Opportunities	<ul style="list-style-type: none"> Participate in developing a solar industry in India, form key partnerships, and assess potential for new technologies to penetrate the Indian and U.S. markets Learn important research results before publication or patenting, and share in developing new intellectual property & research results on technologies with global commercialization potential Leverage new funding and business opportunities
Defining R&D Directions	<ul style="list-style-type: none"> Direct and receive the outcome of a highly regarded bi-national research team developing the future of solar energy conversion Direct R&D with funds-in contributions in line with R&D themes
Gaining Access	<ul style="list-style-type: none"> Interact with leading national centers of excellence in nanoelectronics and photovoltaics Access state-of-the-art R&D capabilities, facilities, and expertise in both countries in a wide range of technical, analysis, modeling/simulation, and assessment tools Firsthand information on important research & policy developments ahead of the rest of world
Developing Workforce	<ul style="list-style-type: none"> Participate in a prestigious international SERIIUS Fellows and Scholars program Access highly talented students, postdocs, and professionals, and educate and train industrial personnel through practice schools and workshops

SERIIUS Team

SERIIUS is jointly funded under the Joint Clean Energy R&D Center (JCERDC) through the Government of India and the U.S. DOE over a 5-year period starting October 1, 2012—with funding of \$25 million for the 5 years in a 50%/50% split between the two countries. The Consortium is also supported by cost share from its members—more than 30 partners from India and the U.S.—with at least the required \$25 million in matching funds.

Consortium Leaders

India: Indian Institute of Science—Bangalore
 U.S.: National Renewable Energy Laboratory

Research Thrust Leadership

India: Indian Institute of Technology—Bombay, Center for the Study of Science, Technology and Policy (CSTEP)
 U.S.: Sandia National Laboratories, RAND Corporation

Consortium Partners

Institutes and National Laboratories

India: International Advanced Research Centre for Powder Metallurgy and New Materials, National Institute for Solar Energy
 U.S.: Lawrence Berkeley National Laboratory

University Partners

India: Indian Institute of Technology—Madras, Indian Association for the Cultivation of Science
 U.S.: Arizona State University, Binghamton University, Carnegie Mellon University, Colorado School of Mines, Massachusetts Institute of Technology, Purdue University, Stanford University, University of Central Florida, University of South Florida, Washington University in St. Louis.

Industry Partners

India: BHEL, Clique Developments Ltd., Hindustan Petroleum Corp., Moser Baer India Ltd., Thermax Ltd., Wipro Ltd.
 U.S.: Alpha Metals, Inc.; Corning Incorporated; Semlux Technologies, Inc.; Solarmer Energy, Inc.; SunEdison; UL

Become a SERIIUS Partner: Three Levels to Meet Your Needs

All SERIIUS Members have pre-publication access to research through Consortium quarterly reports and technical products.

Core Industry Members have:

- Direct involvement in technical work in a Core Project through research design; a permanent seat on the Industry Board with input on R&D directions.
- Right to participate in all consortium activities, meetings, and networks.
- Preferential access to Center Intellectual Property: exclusive option to royalty-bearing licenses.
- Required annual cost share: \$100K funds-in or \$300K in-kind contribution to support and actively participate in either Core or Consortium Projects.

Industry Members have:

- Right to participate in most activities, meetings, and networks.
- Access to Center Intellectual Property: non-exclusive option to royalty-bearing licenses.
- Annual cost share: \$50K funds-in or \$100K in-kind contribution to support and actively participate in either Core or Consortium Projects.

Research or Industry Affiliate Members have:

- Academia and Industry are both eligible for this level of membership.
- Specific benefits to academic partners include access to funded exchange students.
- Right to participate in Consortium activities, meetings, and networks.
- Access to Center Intellectual Property: second option to a royalty-bearing non-exclusive license to any Consortium Project Intellectual Property rights; third option to a royalty-bearing non-exclusive license to any Core Intellectual Property rights.
- Annual cost share: \$25K funds-in or \$50K in-kind contribution to support and actively participate in either Core or Consortium Projects.

Cost share levels listed above are the minimum levels. Higher levels of cost share will entitle entities to higher levels of engagement.

All new Members are vetted by the SERIIUS Leadership Team, Industry Board, and Council.

All Members are required to sign the SERIIUS Multi-Party Non-disclosure Agreement and the Intellectual Property Management Plan.

To join SERIIUS or request more information, please contact:

SERIIUS Co-Directors

Kamanio Chattopadhyay, kamanio@materials.iisc.ernet.in

David Ginley, david.ginley@nrel.gov

Visit our Web Gateway for detailed information: www.SERIIUS.org