

Resume

Name

Dr. V. Ganapathy

Designation

DST-INSPIRE Faculty

Qualification

M.Sc., Ph.D.



Research Experience

11 years and 7 months

Education

2002-2005	B.Sc. (Chemistry) Madras University, India
2005-2007	M.Sc. (Material Science and Technology) Pondicherry University, India
2008-2012	Ph.D. Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), South Korea

Work

Totally 7 years and 7 months

2007-2008	Researcher Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), South Korea
2012-2013	Post-doctoral Fellow (SAINT) SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, South Korea
2013-2015	BK21 Research Fellow School of Chemical Engineering, Sungkyunkwan University, South Korea
2015-till date	DST-INSPIRE Faculty

Centre for Solar Energy Materials, International Advanced
Research Centre for Powder Metallurgy and New Materials
(ARCI), Hyderabad, India

Awards and Honors

- 1 2018 – Selected as a Indian Young Scientist for attending the **BRICS Young Scientist Conclave** meet in **Durban, South Africa**
- 2 2018 – **Best Poster presentation award at National conference of Emerging Materials for Sustainable Future, Feb-09 to Feb 10, 2010, Coimbatore, India**
- 3 2017 – **Outstanding Reviewer for the journal “Applied Surface Science” Nov. 2017**
- 4 2015 – **Awarded DST-INSPIRE Faculty Award**
- 5 2013/15 – **Awarded BK21 Postdoctoral Fellowship in Sungkyunkwan University, Suwon, S. Korea**
- 6 2012/13 – **Awarded Sungkyunkwan Advanced Institute Postdoctoral Fellowship, Suwon, S. Korea**
- 7 2009/10 – **Best Poster presentation award in 9th-Korea-Japan symposium on Materials & Interfaces in Ph.D., Oct-31 to Nov 3, 2010, Yeosu, S.Korea**
- 8 2006/07 – **Best Master Thesis Research Project award in M.Sc. (PG)**
- 9 2003/04 – **Second Prize in College Poster presentation in B.Sc. (UG)**
- 10 2003/04 – **First Prize in College Science day competition in B.Sc. (UG)**

Board of Studies Member

- ✓ JNTU Hyderabad, M.Tech Nanotechnology

Chairperson for International Conference

- ✓ 3rd International Conference on Nanomaterials: Synthesis, Characterization and Applications, May 11-13, 2018, Kottayam, Kerala.

Research Areas of Interest

- ✓ Development of Opto-electronic materials and devices (Perovskites, Quantum dots and Wide band-gap semiconductors; Solar cells, Organic thin film transistors and LEDs).
- ✓ Study the influence of long alkyl amine organic molecules and its impact on perovskite solar cells.
- ✓ Synthesis of single crystalline perovskites for opto-electronic applications
- ✓ Large area and ambient process of perovskite solar cells.

- ✓ Root causes of stability issues in perovskite solar cells and how to avoid it.

Research Expertise

- Design and development of quasi-2D dimensional perovskites.
- Synthesis of single crystalline Inorganic-organic halide perovskites.
- Design and development of carbon based lab-scale and large area perovskite solar cells.
- Synthesis of inorganic-organic halide perovskites, oxide perovskites and quantum dots.
- Flexible optoelectronic devices and non-metal conducting electrodes
- Study the degradation issues of perovskite solar cell on various conditions (ambient, thermal, electrical and stress).
- Thin film development by PVD process (ALD, CVD, Sputtering, thermal and spray pyrolysis) and dip coating

Research Publications

- Publications: Research articles in International Journals- 33
- Book Chapters -04
- Patent -01
 - National and International conferences -22
- Publications: **Total Impact Factors (IF)–200.7**
Average IF/Paper-6.0

Sponsored Projects:

1. Perovskite sensitizers and nanostructured metal oxide for next-generation solar cells, **2015-20, Department of Science and Technology (DST)-Ongoing**
2. Development of solar-powered autonomous road reflectors, **2018-21, Scheme for Young Scientist & Technologist (SYST)-Ongoing**

Reviewer for International Publications

- American Chemical Society (ACS)
- Elsevier
- Royal Society of Science (RSC)
- Springer
- Willey

UG/PG Dissertation Supervised

1. Synthesis and Development of Hole-conductor Free Mixed Halide based Perovskite Solar Cell, by **Mr. M. Suresh**, M.Tech: 2015-16. (Pursuing PhD @ Univ. of Manchester)
2. Design and Fabrication of Perovskite Solar Cell by Semi-vapor deposition, by **Mr. P. Vijendhar Reddy**, M. Tech: 2016-17. (Presently JRF @ NPL Delhi)
3. Hole conductor and Metal cathode free Mixed Cation Perovskite Solar Cells, by **Ms. Reshma K. Dileep**, M. Tech:2017-18. (Presently SRF @ ARCI).
4. Inorganic Hole Transport Material for Highly Stable Perovskite Solar Cells, by **Ms. Ashina**, M.Sc: 2017-18. (Presently GTP @ ARCI).

Man-Power Trained

1. **Ms. Tulja Bhavani**, Synthesis and Characterization of 1-D Nano-Structured Perovskite for Photovoltaic Applications, **PGTP: 2015-16. (Pursuing Ph.D @ IITD).**
2. **Mr. Vishesh Manjunath**, Improving the Efficiency of Perovskite Solar Cell, **PGTP: 2016-17. (Pursuing Ph.D @ IIT Indore)**
3. **Mr. P. Vijendhar Reddy**, Design and Fabrication of Perovskite Solar Cell by Semi-vapor deposition, **PGTP: 2017-18. (Presently JRF @ NPL Delhi)**
4. **Ms. Reshma K. Dileep**, Hole conductor and Metal cathode free Mixed Cation Perovskite Solar Cells, by M. Tech:2017-18. (Presently SRF @ ARCI).

Prototypes Developed

1. 50mm X 50mm Perovskite Solar Cell Module
2. 50mm X 50mm Dye-sensitized Solar Cell Module

Patent

1. Shi-Woo Rhee, Karunagaran Bojan, **Ganapathy Veerappan**, Hye-Min Ra, “**Dye-sensitized solar cells including metal oxide of core shell**”. Korean Patent No: 10-1079413 (2011).

Book Chapters

1. S. Maniarasu, V. Manjunath, E. Ramasamy, **Ganapathy. V***, “**Hole Conductor Free Perovskite Solar Cells**”, **Perovskite Photovoltaics-basic to advanced concepts and implementation**. Elsevier (2018), 289-321.
2. V. Manjunath, Ramya Krishna, S. Maniarasu, E. Ramasamy, S. Shanmugasundaram, **Ganapathy. V***, “**Perovskite Solar Cell Architectures**” **Perovskite Photovoltaics-basic to advanced concepts and implementation**. Elsevier (2018), 89-121.

3. V. Manjunath, S. Maniarasu, **Ganapathy. V**, E. Ramasamy, “**Flexible Perovskite Solar Cells**” **Perovskite Photovoltaics-basic to advanced concepts and implementation**. Elsevier (2018), 341-371.
4. **Ganapathy. V***, E. Ramasamy, B. Gowreeswari, “**Economical and Highly Efficient Non-Metal Counter Electrode Materials for Stable Dye-sensitized Solar Cells**” **Dye-sensitized Solar Cell Mathematical Modelling, Optimization and Design**. Elsevier (2019), 397-435.

List of Publications (Total citation: 987, h-index: 17)

After joining in ARCI (2015-till now)

1. R. K. Dileep, G. Kesavan, M. K. Rajbhar, S. Shanmugasundaram, E. Ramasamy, P. V. Reddy, **Ganapathy. V***, **Room temperature curable carbon cathode for hole-conductor free perovskite solar cells**, *Solar Energy*, Accepted, **(IF: 4.3)**
2. E. Ramasamy, K. Vaithinathan, K. Ramesh Kumar, **Ganapathy. V**, **Glass-to-glass encapsulation with ultraviolet light curable epoxy edge sealing for stable perovskite solar cells**, *Materials Letters* (2019), 250, 51-54. **(IF: 2.7)**
3. S. Maniarasu, M. K. Rajbhar, R. K. Dileep, E. Ramasamy, P. V. Reddy, **Ganapathy. V***, **Hole-conductor free ambient processed mixed halide perovskite solar cells**. *Materials Letters* (2019), 245, 226-229. **(IF: 2.7)**
4. A. S. Ganeshraja, S. Maniarasu, P. V. Reddy, **Ganapathy. V***, K. Vaithinathan, K. Nomura, J. Wang. **Hierarchical Sn and AgCl co-doped TiO₂ Microspheres as Electron Transport Layer for Enhanced Perovskite Solar Cell Performance**. *Catalysis Today* (2018), Accepted. **(IF: 4.6)**
5. S. B. Subramanian, A. Ramani, **V. Ganapathy**, V. Anbazhagan, **Preparation of self-assembled platinum nanoclusters to combat salmonella typhi infection and inhibit biofilm formation**. *Colloids and Surfaces B: Biointerfaces* (2018), 171, 75-84. **(IF: 4.0) (Cited by-2)**
6. S. Maniarasu, T. B. Korukonda, V. Manjunath, E. Ramasamy, R. Mohan, **Ganapathy. V ***. **Recent Advancement in Metal Cathode and Hole-Conductor-free Perovskite Solar Cells for Low-cost and High stability: A Route Towards Commercialization**. *Renewable and Sustainable Energy Reviews* (2018), 82, 845-857. **(IF: 9.1) (Cited by-22)**
7. E. Ramasamy, P. Kathirvel, S. Kumar, S. Koppoju, Ganapathy. V. **Rapid and Scalable Synthesis of Crystalline SnO₂ nanoparticles with Superior Photovoltaic Properties by Flame Oxidation**. *MRS Communications* (2017), 7, 862-866. **(IF: 3.0)**
8. **Ganapathy. V**, * K. Zhang, S. Soman, N. Heo, J. H. Park. **Stibnite Sensitized Hollow Cubic TiO₂ Photoelectrodes for Organic-Inorganic Heterojunction Solar Cells**. *Solar Energy* (2017), 157, 434-440. **(IF: 4.3) (Cited by-4)**

9. V. Karthikeyan, S. Maniarasu, V. Manjunath, E. Ramasamy, **Ganapathy. V** * **Hydrothermally Tailored Anatase TiO₂ Nanoplates with exposed {111} facets for highly efficient Dye-sensitized solar cells.** *Solar Energy* (2017), 147, 202-208. **(IF: 4.3) (Cited by-4)**
10. G. A. Sundaram, M. Yang, K. Nomura, S. Maniarasu, **Ganapathy. V**, T. Liu, J. Wang. **¹¹⁹Sn Mossbauer and ferromagnetic studies on hierarchical tin and nitrogen co-doped TiO₂ microspheres with efficient photocatalytic performance.** *J. Physical Chemistry C* (2017), 121, 6662-6673. **(IF: 4.4). (Cited by-6)**
11. N. Islavath, S. Saroja, K. Srinivasa Reddy, P. C. Harikesh, **V. Ganapathy**, E. Ramasamy, S. V. Joshi. **Effect of hole-transporting materials on the photovoltaic performance and stability of all-ambient processed perovskite solar cells.** *J. Energy Chemistry* (2017), 26, 584-591. **(IF: 3.8). (Cited by-9)**
12. K. Zhang, S. Ravishankar, M. Ma, **Ganapathy Veerappan**, J. Bisquert, F. F. Santiago, J. H. Park. **Overcoming Charge Collection Limitation at Solid/Liquid Interface by a controllable Crystal Deficient Overlayer,** *Advanced Energy Materials* (2017), 7, 1600923. **(IF: 21.8). (Cited by-25)**
13. **Ganapathy. V**, K. Zhang, M. Ma, B. Kang, J. H. Park. **High-reversible capacity of Perovskite BaSnO₃/rGO composite for Lithium-Ion Battery Anodes.** *Electrochimica Acta* (2016), 214, 31-37. **(IF: 5.1). (Cited by-5)**
14. K. Zhang, L. Wang, J. K. Kim, M. Ma, **V. Ganapathy**, C. L. Lee, K. J. Kong, H. Lee, J. H. Park, **An order/disorder/water junction system for highly efficient Co-Catalyst-Free Photocatalytic Hydrogen Generation.** *Energy & Environmental Science* (2016), 9, 499-503. **(IF: 30.0) (Cited by-95)**

Before joining in ARCI-2010-2015

15. K. L. Vincent Joseph, A. Anthonysamy, E. Ramasamy, D. V. Shinde, **V. Ganapathy**, S. Karthikeyan, J. Lee, T. Park, S. W. Rhee, K.S. Kim, J. K. Kim. **Cyanoacetic Acid Tethered Thiophene for well-matched LUMO level in Ru (II)-Terpyridine Dye-Sensitized Solar Cells.** *Dyes and Pigments* (2016), 126, 270-278. **(IF: 3.7) (Cited by-3)**
16. H. Kim, **Ganapathy. V**, **D. H. Wang**, J. H. Park. **Large Area Platinum and Fluorine-doped Tin Oxide-free Dye sensitized Solar Cells with Silver-Nanoplate Embedded Poly (3, 4-Ethylenedioxythiophene) Counter Electrode.** *Electrochimica Acta* (2016), 187, 218-223. **(IF: 5.1) **!! Equal Contribution. (Cited by-7)****
17. C. J. Mo, **V. Ganapathy**, **M. Kim**, J. H. Park. **Self-organized Formation of Embossed Nanopatterns on various Metal Substrates: Application To Flexible Solar Cells.** *Electrochimica Acta* (2015), 176, 636-641. **(IF: 5.1) **!! Equal Contribution. (Cited by-1)****
18. **Ganapathy. V**, S. Yu, D. H. Wang, W. I. Lee, J. H. Park. **Facile Control of Intra-and Inter particle Porosity in Template-Free synthesis of Size-Controlled Nanoporous TiO₂ beads for Efficiency Organic-Inorganic Heterojunction Solar Cells.** *Journal of Power Sources* (2015), 279, 72-79. **(IF: 6.9) (Cited by-4)**
19. K. B. A. Ahmed, S. Subramanian, **V. Ganapathy**, N. Hari, A. Sivasubramanian, V. Anbazhagan. **β -siosterol-D-glucopyranoside Isolated from *Desmostachyabipinnata* mediate Photoinduced**

- Rapid Green Synthesis of Silver Nanoparticles.** *RSC Advances* (2014), 4, 59130-59136. **(IF: 3.0)**
(Cited by-17)
20. J. K. Kim^{!!}, **V. Ganapathy^{!!}**, N. Heo, D. H. Wang, J. H. Park. **Efficient Hole Extraction from Sb₂S₃ Heterojunction Solar Cells by the Solid transfer of Pre-formed PEDOT: PSS film.** *J. Physical Chemistry C* (2014), 118, 22672-22677. **(IF: 4.4) ^{!!}Equal Contribution.** **(Cited by-21)**
 21. V. Chakrapani, K. H. Ayaz Ahmed, V. Vinod Kumar, **V. Ganapathy**, S. Philip Anthony, V. Anbazhagan. **A facile route to synthesize casein capped copper nanoparticles: an effective antibacterial agent and selective colorimetric sensor for mercury and tryptophan.** *RSC Advances* (2014), 4, 33215-33221. **(IF: 3.0) (Cited by-33)**
 22. H. Kim^{!!}, **Ganapathy. V^{!!}**, J. H. Park. **Conducting Polymer coated Non-woven Graphite-Fiber film for Dye-sensitized Solar cells: Superior Pt-and FTO-free counter electrodes.** *Electrochimica Acta.* (2014), 137, 164-168. **(IF: 5.1) ^{!!}Equal Contribution.** **(Cited by-20)**
 23. K. B. A. Ahmed, S. Subramanian, A. Sivasubramanian, **V. Ganapathy**, V. Anbazhagan. **Preparation of gold nanoparticles using salicorniabrachiata plant extract and evaluation of catalytic and antibacterial activity.** *Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy* (2014), 130, 54-58. **(IF:2.8) (Cited by-61)**
 24. S. Venkatakrishnan, **V. Ganapathy**, E. Elamparuthi, V. Anbazhagan. **Aerobic synthesis of biocompatible copper nanoparticles: Promising antibacterial agent and catalyst for nitroaromatic reduction and C-N cross coupling reaction.** *RSC Advances* (2014), 4, 15003-15006. **(IF: 3.0) (Cited by-24)**
 25. **V. Ganapathy**, D. W. Jung, J. Kwon, J. Choi, H. Nansra, J. H. Park, G. Ra. Yi. **Multi Functionality of Macroporous TiO₂ spheres in Dye-sensitized and Hybrid Heterojunction solar cells.** *Langmuir* (2014), 30, 3010-3018. **(IF: 3.8). (Cited by-36)**
 26. **V. Ganapathy**, E.H. Kong, Y.C. Park, Hyun. M. Jang, Shi-Woo Rhee. **Cauliflower-like SnO₂ Hollow Microspheres as Photoanode with Carbon fiber Counter Electrode for High-Performance Quantum Dot-and Dye-Sensitized Solar Cells.** *Nanoscale* (2014), 6, 3296-3301. **(IF: 7.2) (Cited by-38)**
 27. T. Pazhanivel, V. P. Devarajan, S. Bharathi, K. Senthil, **V. Ganapathy**, K. Yong, N. Devaraj. **Systematic Investigation on the Structure and Photophysical Properties of CdSe, CdSe/ZnS QDs and their Hybrids with Beta Carotene.** *RSC Advances* (2013), 3, 26116-26126. **(IF: 3.0) (Cited by-6)**
 28. J. Kwon, ^{!!} **V. Ganapathy^{!!}**, Y. H. Kim, K. D. Song, H. G. Park, Y. Jun, P. J. Yoo, J. H. Park. **Nanopatterned conductive polymer films as a Pt, TCO-free counter electrode for low-cost dye-sensitized solar cells.** *Nanoscale* (2013), 5, 7838-7844. **(IF: 7.2) (Cited by-48) ^{!!}Equal Contribution.**
 29. **V. Ganapathy**, B. Karunakaran, Shi-Woo Rhee. **Amorphous Carbon Counter Electrode for Low-cost and efficient Dye-sensitized Solar Cells.** *Renewable energy* (2012), 41, 383-388. **(IF: 4.9) (Cited by-48)**

30. **V. Ganapathy**, W. Kwon, Shi-Woo Rhee. **Carbon-nanofiber counter electrodes for quasi-solid state dye-sensitized Solar Cells.** *Journal of Power Sources* (2011), 196, 10798-10805. **(IF: 6.9)** **(Cited by-49)**
31. A. Anthonysamy, Y. Lee, B. Karunakaran, **V. Ganapathy**, Shi-Woo Rhee, S. Karthikeyan, Kwang Soo Kim, Min Jae Ko, Nam-Gyu Park, M. J. Ju, Jin Kon Kim. **Molecular design and synthesis of Ruthenium (II) sensitizers for high efficient Dye-sensitized Solar Cells: Combined experimental and DFT-TDDFT computational studies.** *Journal of Material Chemistry* (2011), 21, 12389-12397. **(IF: 6.6)** **(Cited by-31)**
32. **V. Ganapathy**, B. Karunakaran, Shi-Woo Rhee. **Sub-micrometer-sized Graphite as a Conducting and Catalytic Counter Electrode for Dye-sensitized Solar Cells.** *ACS Applied Material & Interfaces* (2011), 3, 857-862. **(IF: 8.0)** **(Cited by-223)**
33. **V. Ganapathy**, B. Karunakaran, Shi-Woo Rhee. **Improved performance of dye-sensitized solar cells with TiO₂/ Alumina core-shell formation using atomic layer deposition.** *Journal of Power Sources* (2010), 195, 5138-5143. **(Top 25 Hottest Articles from April to June 2010 & July to September 2010).** **(IF: 6.9)** **(Cited by-138)**

Invited Talks

1. **Ganapathy. V***, “Moisture Resistant Quasi-Two Dimensional Perovskite and Carbon Electrodes for Stable Perovskite Solar Cells” India-UK 2nd International Conference on Advanced Nanomaterials for Energy, Environment and Healthcare Applications, Feb-4-6, 2019, Tiruchirappali, Tamilnadu.
2. **Ganapathy. V***, “Nanostructured Materials for Photovoltaic Applications” 3rd International Conference on Nanomaterials: Synthesis, Characterization and Applications, May 11-13, 2018, Kottayam, Kerala.
3. **V. Ganapathy *** “Recent Solar Technologies and the Future Perspectives” at Geethanjali College of Engg. Hyderabad, Telangana, 2018.
4. **V. Ganapathy *** “Next-Generation Photovoltaics” MVSR Engg. College, Hyderabad, Telangana, 2018.
5. **V. Ganapathy *** “Perovskite, Quantum-dot and Dye-sensitized Solar cells” National Seminar on Emerging Trends in Harnessing Green Energy, March, 2018), Ananthpur, Andhra Pradesh.
6. **V. Ganapathy *** “Next-generation photovoltaics for sustainable green energy” Nanofluid Application for Heat-Transfer and Energy Systems & Simulation using CFD. September, 2016), Visakapatnam, Andhra Pradesh.
7. **Ganapathy. V***, “Inorganic sensitizers and nanostructured metal oxides for next-generation solar cells. ARCI, Hyderabad, 2014.
8. **Ganapathy. V***, “Alternative counter electrode and recombination free photoelectrode for highly efficient and stable dye-sensitized solar cells. CSIR-CECRI, Karaikudi, 2012.

Selected Conference Presentation

1. **V. Ganapathy** , B. Karunakaran and Shi-Woo Rhee “**Improved performance in Dye sensitized solar cells employing alumina modified TiO₂ photoelectrodes**” 19th International Photovoltaic Science and Engineering Conference and Exhibition (19th PVSEC). (09-13th November, 2009), ICC- Jeju, Korea. (*Oral Talk*)
2. Shi-Woo Rhee, **V. Ganapathy**, and B. Karunakaran “**Atomic layer deposition of thin Al₂O₃ barrier layers for efficient dye sensitized solar cells**” 9th International Conference on Atomic Layer Deposition (AVS). (19-22nd July, 2009), California, USA. (*Invited Talk*)
3. **V. Ganapathy** , B. Karunakaran and Shi-Woo Rhee “**Low temperature spray coated nano-carbon counter electrode for Dye sensitized solar cells**” International Union of Materials Research Societies-International Conference on Electronic Materials (IUMRS-ICEM 2010). (22-27th November, 2010), Kintex- Seoul, Korea. (*Oral Talk*)
4. **V. Ganapathy**, B. Karunakaran and Shi-Woo Rhee “**Flexible carbon counter electrode for low cost and efficient Dye-sensitized solar cells**” Korean Institute of Chemical Engg. Conference (KiChe). (20-22th October, 2010), Daejeon, Korea. (*Oral Talk*)
5. **V. Ganapathy**, B. Karunakaran and Shi-Woo Rhee. “**Flexible carbon-nanofiber counter electrode for quasi-solid state dye-sensitized solar cells**” Material Research Society (2011MRS Spring meeting). (25-30th April, 2011), Moscone West convention center, San Francisco, USA. (*Poster*)
6. **V. Ganapathy** , H. Nansra, K. Zhang, J. H. Park “**Stibnite sensitized Hollow cubic TiO₂ for high performance Heterojunction solar cells**” 3rd International conference on Semiconductor Sensitized and Quantum Dot Solar cells. (9-11th June, 2013), Granada, Spain. (*Oral Talk*)
7. **V. Ganapathy** * “**Nanostructured Metal oxide Photoanodes for Next Generation Solar cells**” 2nd National Conference on Materials for Energy Conversion and Storage. (11-13th March, 2016), Pondicherry, India. (*Oral Talk*)
8. M. Suresh, **V. Ganapathy** *, **Synthesis and Development of Hole-Conductor free ambient processed Mixed Halide Perovskite Solar Cells**, 2nd International Conference on Solar Energy Photovoltaic (ICSEP-2016, Dec 17-19), Bhubaneswar, India (*Oral Talk*)
9. Lokeswari, Tulja Bhavani, M. Suresh, M. Vishesh, **V. Ganapathy** *, **Alkaline metal: A potential Candidate for Pb Replacement in HTM free Perovskite Solar Cells**, 2nd International Conference on Solar Energy Photovoltaic (ICSEP-2016, Dec 17-19), Bhubaneswar, India (*Poster*)
10. P. Vijendhar Reddy, E. Ramasamy, **V. Ganapathy** *, **Fabrication of large grain perovskite films for highly efficient and stable perovskite solar cells**, 3rd International Conference on Nanomaterials: Synthesis, Characterization and Applications, May 11-13, 2018, Kottayam, Kerala. (*Oral Talk*)

Affiliation to Professional societies

Electrochemical Society (ECS)

International Solar Energy Society (ISES)

Contact Information

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