

INDIKA U. ARACHCHIGE, Ph. D.

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EDUCATION

- Ph.D., Inorganic Materials Chemistry, (2007) Wayne State University, Detroit, Michigan. Dissertation: "Sol-Gel Routes for Metal Chalcogenide Nanoparticle Assembly"
- B.Sc. (Honors) in Chemistry, (2001) University of Kelaniya, Sri Lanka.

RESEARCH EXPERIENCE AND PROFESSIONAL APPOINTMENTS

07/2017 - present Associate Professor, Virginia Commonwealth University
08/2011 - 06/2017 Assistant Professor, Virginia Commonwealth University
04/2009 - 08/2011 Research Associate, Los Alamos National Laboratory
08/2007 - 03/2009 Postdoctoral Research Fellow, Northwestern University
08/2002 - 07/2007 Graduate Research/Teaching Assistant, Wayne State University
01/2001 - 07/2002 Graduate Research/Teaching Assistant, University of Kelaniya, Sri Lanka

AWARDS AND FELLOWSHIPS

- VCU College of Humanities and Sciences – Excellence in Scholarship, 2017
- Esther and Stanley Kirschner Outstanding Graduate Student Award, 2007
- Wilfred Heller Outstanding Graduate Research Fellowship, Wayne State University, 2006-2007
- Dissertation Research Fellowship, Graduate School, Wayne State University, 2006
- Undergraduate Educational Fellowship, Department of Education, Sri Lanka, 1996-2000

TEACHING EXPERIENCE AND COURSE DEVELOPMENT

08/2011 - present Assistant/Associate Professor, Virginia Commonwealth University

1. CHEM 622 Special Topics in Solid State and Materials Chemistry

- Developed a new course on solid state and materials chemistry for senior undergraduate and graduate students. Topics discussed include: amorphous and crystalline solids, crystal structures, unit cells and packing, Miller indices, crystallographic directions and planes, crystal defects and non-stoichiometric compounds, phase diagrams and solid solutions, band structure and theory, powder X-ray diffraction and X-ray crystallography.
- Developed a module in which students are required to write a review on an anonymized paper submitted to an ACS journal, critically analyze the strengths and weaknesses, and make recommendation for publication. In addition to grading by the instructor, part of their literature critique assignment score is based on peer-review by their classmates.

2. CHEM 620 Advanced Inorganic Chemistry II

- Incorporated fundamental principles of solid-state, materials and nanochemistry into the traditional inorganic graduate level course. Used models to understand packing in solids and the internet to access short, public domain courses on the structures of solids and structure-property and size-property relationships of nanostructured and bulk materials.
- Developed a module in which students are required to write a mini review or a proposal on a topic related to research conducted by VCU faculty. In addition to grading by the instructor, part of their assignment score is based on peer-review by their classmates.
- Incorporated a literature presentation module in which students are required to conduct a literature search on a topic related to Inorganic Chemistry and present their findings.

3. CHEM 102 General Chemistry II

- Prepared a series of PowerPoint lectures including a collection of hot materials topics/videos to accompany the text for CHEM 102 and provided them to students online via Blackboard.

4. Undergraduate, Masters and Doctoral Theses/Dissertations Directed

- **Venkatesham Tallapally**, Ph.D. in Chemistry, “Colloidal Synthesis and Photophysical Characterization of Group IV Alloy and Group IV-V Semiconductors: Ge-Sn and Sn-P Quantum Dot” August 2018.
- **Christopher Ohlhaber**, M. Sc. in Chemistry, “Detection of 20-Hydroxyeicosatetraenoic Acid by Use of Surface Enhanced Raman Spectroscopy: Substrate Development and Detection” August 2018.
- **Lamia Nahar**, Ph.D. in Chemistry, “Sol-Gel Chemistry: An Advanced Technique to Produce Macroscopic Nanostructures of Metal and Semiconductor Colloids” May 2017.
- **Dilhara Liyanage**, M. Sc. in Chemistry, “Efficient Integration of Plasmonic and Excitonic Properties of Metal and Semiconductor Nanostructures via Sol-Gel Assembly” May 2017.
- **Richard J Alan Esteves**, Ph. D. in Nanoscience and Nanotechnology, “The Dawn of New Quantum Dots: Synthesis and Characterization of $\text{Ge}_{1-x}\text{Sn}_x$ Nanocrystals for Tunable Bandgaps”, December 2016.
- **Xiaonan Gao**, Ph. D. in Chemistry, “Sol-Gel Assembly of Metal Nanostructures into Metallic Gel Frameworks and Their Applications”, May 2016.
- **Jordan N. Nowaczyk**, B. Sc. (Honors) in Chemistry, “Synthesis and Characterization of Ag/Pd/Au Alloy Nanoparticles and Hollow Nanoparticles and Their Self-Assembly into Aerogels”, May 2016.
- **Minh Q. Ho**, M. Sc. in Chemistry, “Colloidal Synthesis and Optical Characterization of Semiconductor Nanocrystals from Non-Toxic Elements”, December 2015.

RESEARCH INTERESTS AND SUPPORT

A. Funded Research Grants/Awards

Agency	Funding	Time period	Title/Role of the grant
National Science Foundation - Division of Chemistry (CHE-1851916)	\$312,309 (Recommended for funding)	04/01/2019-03/31/2022	Title: REU Site: Practices and Perspectives in Nanoscience and Chemical Biology. Role: Arachchige, PI ; Ruder, co-PI
College of Humanities and Sciences-Catalyst Award	\$ 20,000	02/01/2018-08/31/2019	Title: Low-Dimensional $\text{Si}_{1-x}\text{Sn}_y$ Alloys for Low-Cost and High-Efficiency Solar Cells. Role: Arachchige , single PI
National Institute of Child Health and Human Development /NIH/DHHS (1U01HD087198-01)	\$ 4,228,935 (total)	09/17/2015-08/31/2019	Title: The Utilization of Photonic Technology to Rapidly Detect Bioactive Lipids Associated With Preeclampsia Development. Role: Arachchige, Co-I ; Chalfant, Charles E.; PI; Walsh, Scott, PI; Wijesinghe, Shanaka, PI. This is a multi-PI grant.
National Science Foundation-Division of Materials Research (DMR-1506595)	\$ 389,074 (total)	06/01/2015-05/31/2019	Title: SusChEM: Synthesis and Structure-Property Elucidation of Direct-Bandgap Group IV Alloy Nanocrystals for Optoelectronic Applications. Role: Arachchige, PI ; Özgür, Co-PI; Demchenko, Co-PI

American Chemical Society: Petroleum Research Fund (ACS-PRF, 52423-DNI10)	\$ 100,000	09/01/2012-08/31/2015	Title: Sol-Gel Assembly of Metal Particles into a New Class of Porous Nanostructures and Their Application in Heterogeneous Catalysis. Role: Arachchige, single PI
VCU Presidential Research Quest Fund (PRQF)	\$ 50,000	07/01/2013-12/31/2015	Title: Direct-gap Group IV Nanocrystals as Cheap and Efficient Materials for Optoelectronic Applications. Role: Arachchige, single PI

B. Research in Progress

- Synthesis of Direct-Gap Group IV Semiconductor Nanocrystals for Application in High-Efficiency Optoelectronics.
- Direct Self-Supported Assembly of Noble Metal Nanoparticles into High-Surface-Area, Hierarchically Porous, Highly Conducting Superstructures (Aerogels) for Application in Surface Enhanced Raman Scattering and Heterogeneous Catalysis.
- Synthesis of Metal-Semiconductor Hybrid Nanostructures for Efficient Integration of Plasmonic and Excitonic Properties for Enhanced Light-Matter Interactions.
- Synthesis of Main Group and Transition Metal Phosphide Nanostructures for Application in Photocatalysis and Electrocatalysis.

C. Fellowships Received for Graduate Advisees under the Direction of Dr. Arachchige

- Altria Research Fellowship, 2017/18 (\$ 18,000 + tuition/fees, **Venkatesham Tallapally**)
- Graduate School Dissertation Assistantship, 2016/17 (\$ 17,250 + tuition/fees, **Lamia Nahar**)
- Graduate School Dissertation Assistantship, 2016 (\$ 8,625 + tuition/fees, **Richard Esteves**)
- Altria Research Fellowship, 2015/16 (\$ 17,000 + tuition/fees, **Lamia Nahar**)
- Fred M. Hawkrige Summer Fellowship, 2015 (\$5,500 + fringe, **Lamia Nahar**)
- Altria Research Fellowship, 2014/15 (\$ 17,000 + tuition/fees, **Xiaonan Gao**)

D. VCU Undergraduate Research and Creative (UROP) Scholarships Received for Advisees under the Direction of Dr. Arachchige.

Shihara Dewasinghe (summer 2017); **Piotr Woźniak** (summer 2017); **Nilan Vaghjiani** (summer 2016); and **Robert Haufler** (summer 2015).

PEER-REVIEWED JOURNAL ARTICLES (Total Citations >1400; h-index = 17)

A1. Research Publications at VCU (Undergraduate co-authors are bold)

1. Tallapally, Venkatesham; Nakagawara, Tanner A.; Demchenko, Denis O.; Ümit Özgür; Arachchige, Indika U.* "Ge_{1-x}Sn_x Alloy Quantum Dots with Composition-Tunable Energy Gaps and Near-Infrared Photoluminescence" *Nanoscale* **2018**, 10, 20296–20305.
DOI: 10.1039/C8NR04399J
2. Ohlhaber, Christopher M.; Rutan, Sarah A.; Bertino, Massimo F.; Wijesinghe, Dayanjan S.; Arachchige, Indika U.* "Applications of Surface Enhanced Raman Scattering toward the Detection of the Bioactive Lipid 20-HETE" *ACS Appl. Nano Mater.* **2018**, 1, 4064–4072.
DOI: 10.1021/acsanm.8b00840

3. Nahar, Lamia; Farghaly, Ahmed A.; Esteves, Richard A.; Arachchige, Indika U.* "Shape Controlled Synthesis of Au/Ag/Pd Nanoalloys and Their Oxidation-Induced Self-Assembly into Electrocatalytically Active Aerogel Monoliths" **Chem. Mater.** **2017**, *29*, 7704–7715.
DOI: 10.1021/acs.chemmater.7b01731
4. Demchenko, Denis O.;* Tallapally, Venkatesham; Esteves, Richard J.; Hafiz, Shopan; Nakagawara, Tanner A.; Arachchige, Indika U.; Ümit Özgür "Optical Transitions and Excitonic Properties of Ge_{1-x}Sn_x Alloy Quantum Dots" **J. Phys. Chem. C** **2017**, *121*, 18299–18306.
DOI: 10.1021/acs.jpcc.7b06458
5. Arachchige, Indika U.; Armatas G. S.; Biswas, K.; Subrahmanyam, K. S.; Lattur, S.; Malliakas, C. D.; Manos, M. J.; Oh, Y.; Polychronopoulou, P.; Poudeu, P. F. P.; Trikalitis, P. N.; Zhang, Q.; Zhao, L.-D.; Peter, S. C.* "Mercouri G. Kanatzidis: Excellence and Innovations in Inorganic and Solid State Chemistry" **Inorg. Chem.** **2017**, *56*, 7582–7597.
DOI: 10.1021/acs.inorgchem.7b00933
6. Esteves, Richard J.; Hafiz, Shopan A.; Demchenko, Denis O.; Özgür, Ümit; Arachchige, Indika U.* "Ultra-Small Ge_{1-x}Sn_x Quantum Dots with Visible Photoluminescence" **Chem. Commun.** **2016**, *52*, 11665–11668.
DOI: 10.1039/C6CC04242B
7. Hafiz, Shopan A.; Esteves, Richard J.; Demchenko, Denis O.; Arachchige, Indika U.; Özgür, Ümit* "Energy-Gap Tuning and Carrier Dynamics in Colloidal Ge_{1-x}Sn_x Quantum Dots" **J. Phys. Chem. Lett.** **2016**, *7*, 3295–3301.
DOI: 10.1021/acs.jpcclett.6b01333
8. Tallapally, Venkatesham; Esteves, Richard J.; Nahar, Lamia; Arachchige, Indika U.* "Multivariate Synthesis of Tin Phosphide Nanoparticles: Temperature, Time, and Ligand Control of Size, Shape, and Crystal Structure" **Chem. Mater.** **2016**, *28*, 5406–5414.
DOI: 10.1021/acs.chemmater.6b01749
9. Sahoo, Nanda G.; Esteves, Richard J.; Punetha, Vinay D.; Pestov, Dimtry; Arachchige, Indika U.; McLeskey, James T.* "Schottky Diodes from 2D Germanane" **Appl. Phys. Lett.** **2016**, *109*, 023507/1-023507/4.
DOI: <http://dx.doi.org/10.1063/1.4955463>
10. Gao, Xiaonan; Esteves, Richard J.; Nahar, Lamia; **Nowaczyk, Jordan N.**; Arachchige, Indika U.* "Direct Cross-Linking of Au/Ag Alloy Nanoparticles into Monolithic Aerogels for Application in Surface Enhanced Raman Scattering" **ACS Appl. Mater. Interfaces** **2016**, *8*, 13076–13085.
DOI: 10.1021/acsami.5b11582
11. Nahar, Lamia; Esteves, Richard J.; Hafiz, Shopan; Özgür, Ümit; Arachchige, Indika U.* "Metal-Semiconductor Hybrid Aerogels: Evolution of Optoelectronic Properties in a Low Dimensional CdSe/Ag Nanoparticle Assembly" **ACS Nano** **2015**, *9*, 9810–9821.
DOI: 10.1021/acs.nano.5b02777
12. Ho, Min Q.; Esteves, Richard J.; Kedarnath, Gotluru; Arachchige, Indika U.* "Size Dependent Optical Properties of Luminescent Zn₃P₂ Nanocrystals" **J. Phys. Chem. C.** **2015**, *119*, 10576–10584. DOI: 10.1021/acs.jpcc.5b01747
13. Esteves, Richard J.; Ho, Min Q.; Arachchige, Indika U.* "Nanocrystalline Group IV Alloy Semiconductors: Synthesis and Characterization of Ge_{1-x}Sn_x Quantum Dots for Tunable Bandgaps" **Chem. Mater.** **2015**, *27*, 1559–1568.
DOI: 10.1021/cm503983b

14. Altarawneh, Suha; Nahar, Lamia; Arachchige, Indika U.;* El-Ballouli, Ala'a O.; Hallal, Kassem M.; Kaafarani, Bilal R.;* Rabbani, Mohammad G.; Arvapally, Ravi K.; El-Kaderi, Hani M.* "Highly Porous and Photoluminescent Pyrenequinoxaline-Derived Benzimidazole-Linked Polymers" *J. Mater. Chem. A* **2015**, 3, 3006–3010.
DOI: 10.1039/C4TA05727A
15. Gao, Xiaonan; Esteves, Richard J.; **Luong, Thi T. H.**; **Jaini, Rajendra**; Arachchige, Indika U.* "Oxidation-Induced Self-Assembly of Ag Nanoshells into Transparent and Opaque Ag Hydrogels and Aerogels" *J. Am. Chem. Soc.* **2014**, 136, 7993–8002.
DOI: 10.1021/ja5020037
16. Kulugamma, Ranmohotti G.; Gao, Xiaonan; Arachchige, Indika U.* "Salt-Mediated Self-Assembly of Metal Nanoshells into Metallic Aerogels" *Chem. Mater.* **2013**, 25, 3528–3534.
DOI: 10.1021/cm401968j
17. Nahar, Lamia; Arachchige, Indika U.* "Sol-Gel Methods for the Assembly of Metal and Semiconductor Nanoparticles" *JSM Nanotechnol. Nanomed.* **2013**, 1, 1004/1–1004/6.

A2. Publications from Undergraduate, Graduate, and Postdoctoral Research

18. Soriano, Ronlad A.; Arachchige, Indika U.; Malliakas, Christos D.; Wu, Jinsong; Kanatzidis, Mercuri G.* "Nanoscale Stabilization of New Phases in the PbTe–Sb₂Te₃ System: Pb_mSb_{2n}Te_{m+3n} Nanocrystals" *J. Am. Chem. Soc.* **2013**, 135, 768-774.
DOI: 10.1021/ja309626q
19. Ivanov, Sergei A.;* Arachchige, Indika U.; Aikens, Christine M.* "Density Functional Analysis of Geometries and Electronic Structures of Gold-Phosphine Clusters. The Case of Au₄(PR₃)₄²⁺ and Au₄(μ₂-I)₂(PR₃)₄" *J. Phys. Chem. A* **2011**, 115, 8017–8031.
DOI: 10.1021/jp200346c
20. Arachchige, Indika U.; Malliakas, Christos D.; Soriano, Ronlad A.; Ivanov, Sergei A.; Kanatzidis, Mercuri G.* "Amorphous and Crystalline GeTe Nanoparticles" *Adv. Funct. Mater.* **2011**, 21, 2737–2743. DOI: 10.1002/adfm.201100633
21. Wu, Jinsong; He, Jiaqing; Han, Mi-Kyung; Sootsman, Joseph R.; Girard, S.; Arachchige, Indika U.; Kanatzidis, Mercuri G.; David, Vinayak P., "Electron-Beam Activated Thermal Sputtering of Thermoelectric Materials" *J. Appl. Phys.* **2011**, 110, 044325/1-044325/6.
DOI: 10.1063/1.3624755
22. Wang, Ruomiao; Li, Li; Arachchige, Indika U.; Ganguly, Shreyashi; Brock, Stephanie L.; Mao, Guangzhao, "Nanoparticles Change the Ordering Pattern of n-Carboxylic Acids into Nanorods on HOPG" *ACS Nano* **2010**, 4, 6687-6696.
DOI: 10.1021/nn102184y
23. Pala, Irina R.; Arachchige, Indika U.; Georgiev, Daniel G.; Brock, Stephanie L.* "Reversible Gelation of II-VI Nanocrystals: The Nature of Interparticle Bonding and the Origin of Nanocrystal Photochemical Instability" *Angew. Chem. Int. Ed.* **2010**, 49, 3661-3665.
DOI: 10.1002/anie.201000034
24. Arachchige, Indika U.; Kanatzidis, Mercuri G.* "Anomalous Band Gap Evolution from Band Inversion in Pb_{1-x}Sn_xTe Nanocrystals" *Nano Lett.* **2009**, 9, 1583-1587.
DOI: 10.1021/nl8037757

25. Yao, Qinghong; Arachchige, Indika U.; Brock, Stephanie L.* “Expanding the Repertoire of Chalcogenide Nanocrystal Networks: Ag₂Se Gels and Aerogels by Cation Exchange Reactions” **J. Am. Chem. Soc.** **2009**, 131, 2800-2801.
DOI: 10.1021/ja900042y
26. Arachchige, Indika U.; Wu, Jinsong; Dravid, Vinayak P.; Kanatzidis, Mercouri G.* “Nanocrystals of the Quaternary Thermoelectric Materials AgPb_mSbTe_{m+2} (m=1-18): Phase-Segregated or Solid Solutions?” **Adv. Mater.** **2008**, 20, 3638-3642.
DOI: 10.1002/adma.200801116
27. Bag, Santanu; Arachchige, Indika U.; Kanatzidis, Mercouri G.,* “Aerogels from Metal Chalcogenides and Their Emerging Unique Properties” **J. Mater. Chem.** **2008**, 18, 3628-2632.
DOI: 10.1039/B804011G
28. Arachchige, Indika U.; Brock, Stephanie L.* “Highly Luminescent Quantum Dot Monoliths” **J. Am. Chem. Soc.** **2007**, 129, 1840-1841. (Highlighted by **Science** **2007**, 315, 741).
DOI: 10.1021/ja066749c
29. Arachchige, Indika U.; Brock, Stephanie L.* “Sol-Gel Assembly of CdSe Nanoparticles to Form Porous Aerogel Networks” **J. Am. Chem. Soc.** **2006**, 128, 7964-7971. (Highlighted by **Anal. Chem.** **2006**, 78, 5975).
DOI: 10.1021/ja061561e
30. Arachchige, Indika U.; Mohanan, Jaya L.; Brock, Stephanie L.* “Sol-Gel Processing of Semiconducting Metal Chalcogenide Xerogels: Influence of Dimensionality on Quantum Confinement Effects in a Nanoparticle Network” **Chem. Mater.** **2005**, 17, 6644-6650.
DOI: 10.1021/cm0518325
31. Mohanan, Jaya L.; Arachchige, Indika U.; Brock, Stephanie L.* “Porous Semiconductor Chalcogenide Aerogels” **Science** **2005**, 307, 397-400.
DOI: 10.1126/science.1104226
- This work has been highlighted by Chemical & Engineering News, Nanotechweb.org, Materials Research Society eMatters, Electrical Engineering Times, Technology Research News, Optics and Photonics News, Materials Today News, and **Angew. Chem. Int. Ed.** **2005**, 44, 4839-4841).
32. Chen, Dongzhong; Wang, Ruomiao; Arachchige, Indika U.; Mao, Guangzhao;* Brock, Stephanie L., “Particle–Rod Hybrids: Growth of Arachidic Acid Molecular Rods from Capped Cadmium Selenide Nanoparticles” **J. Am. Chem. Soc.** **2004**, 126, 16290-16291.
DOI: 10.1021/ja045011x
33. Weerasooriya, R.*; Tobschall, H. J.; Wijesekara, H. K. D. K; Arachchige, E. K. I. A. U. K.; Pathiratne, K. A. S., “On the Mechanistic Modeling of As(III) Adsorption on Gibbsite” **Chemosphere** **2003**, 51, 1001-1013.
DOI: 10.1016/S0045-6535(03)00157-7

B. Invited Review Articles

34. Arachchige, Indika U.; Brock, Stephanie L.,* “Sol-Gel Method for the Assembly of Metal-Chalcogenide Quantum Dots” **Acc. Chem. Res.** **2007**, 40, 801-809.
DOI: 10.1021/ar600028s
35. Brock, Stephanie L.*; Arachchige, Indika U.; Kalebaila, Kennedy K., “Metal Chalcogenide Gels, Xerogels and Aerogels” **Comments Inorg. Chem.** **2006**, 27, 103-126.
DOI: 10.1080/02603590601084434

C. Patents

36. Mao, Guangzhao; Brock, Stephanie L.; Chen, Dongzhong; Wang, Ruomiao; Arachchige, Indika U., "Particle-Rod Nanostructures and Method of Forming Same by Spin Coating" U.S. Patent # 7,709,054 issued 5/4/2010.

D. Book Chapters

37. Wang, Ruomiao; Arachchige, Indika U.; Brock, Stephanie L.; Mao, Guangzhao, "Nanoparticles as Seeds for Organic Crystallization" in **ACS Symposium Series No. 996/Nanoparticles: Synthesis, Stabilization, Passivation and Functionalization** R. Nagarajan and T. A. Hatton, Eds., 2008, pp 358-368.

CONTRIBUTED PAPERS/PRESENTATIONS AT REGIONAL AND NATIONAL CONFERENCES

(Past ~5 years, undergraduate co-authors are bold, presenter underlined)

1. "Colloidal Synthesis, Energy Gap Tuning, and Carrier Dynamics of GeSiSn Alloy Quantum Dots with Visible to Near IR Photoluminescence" Eladgham, Ebtessam H.; Nakagawara, Tanner A.; Demchenko, Denis O.; Ozgur, Ümit; Arachchige, Indika U. 256th ACS National Meeting, Boston, MA, United States, 08/19/18-08/23/28, INOR-585, *oral*.
2. "Colloidal Synthesis of Highly Luminescent Lithium Silicate Nanoparticles and Their Chemical Transformation into Different Crystal Structures" Eladgham, Ebtessam; Nakagawara, Tanner A.; Ozgur, Ümit; Demchenko, Denis O.; Arachchige, Indika U. 256th ACS National Meeting, Boston, MA, United States, 08/19/20/18-08/23/18, INOR-472, *poster*.
3. "Nanostructured Au/Ag/Pd Alloy Aerogels as High Efficiency Alcohol Oxidation Electrocatalysts" Nahar, Lamia; Farghaly, Ahmed; Esteves, Richard; Arachchige, Indika U.* 254th ACS National Meeting, Washington, DC, 08/20/17-08/24/17, *oral*.
4. **Vaghjiani, Nilan**; Nahar, Lamia; Arachchige, Indika U.* "Ag and Au/Ag Nanostructures as High Efficiency Surface Enhance Raman Scattering Substrates for Detection of Biomolecules" ACS Virginia Section Meeting: Undergraduate Poster Session, Charlottesville, VA, 04/14/17, *poster*.
5. Esteves, Richard J.; Hafiz, Shopan; Demchenko, Denis O.; Özgür, Ümit; Arachchige, Indika U.* "Ultra-Small Ge_{1-x}Sn_x Quantum Dots with Orange-Red Photoluminescence" 252th ACS National Meeting, Philadelphia, PA, 08/21/16-08/25/16, *oral*.
6. Nahar, Lamia; Gao, Xiaonan; Arachchige, Indika U.* "Hierarchically Porous, Highly Conducting, Au/Pd Alloy Aerogels as High Efficiency Alcohol Oxidation Electrocatalysts" 252nd ACS National Meeting, Philadelphia, PA, 08/21/16-08/25/16, *oral*.
7. Tallapally, Venkatesham; Esteves, Richard J.; Arachchige, Indika U.* "Size, Shape, and Phase Control Synthesis of Crystalline and Amorphous Tin Phosphide Nanoparticles" 252nd ACS National Meeting, Philadelphia, PA, 08/21/16-08/25/16, *oral*.
8. Esteves, Richard J.; Hafiz, Shopan; Demchenko, Denis O.; Özgür, Ümit; Arachchige, Indika U.* "Exciton Carrier Dynamics of Luminescent Ge_{1-x}Sn_x Quantum Dots" 252nd ACS National Meeting, Philadelphia, PA, 08/21/16-08/25/16, *poster*.
9. Naha, Lamia; Gao, Xiaonan; Esteves, Richard J.; Arachchige, Indika U.* "Sol-gel Assembly of Au/Ag Alloy Nanoparticles into Aerogels for Application in Surface Enhanced Raman Scattering" 252nd ACS National Meeting, Philadelphia, PA, 08/21/16-08/25/16, *poster*.

10. Tallapally, Venkatesham; Esteves, Richard J.; Arachchige, Indika U.* “Tunable Size and Shape Control Synthesis of Crystalline and Amorphous Tin Phosphide Nanoparticles” 252nd ACS National Meeting, Philadelphia, PA, 08/21/16–08/25/16, *poster*.
11. Nahar, Lamia, Farghaly; Ahmed A., Arachchige; Indika U.* “Metal Aerogels as High Efficiency Alcohol Oxidation Electrocatalysts” 252nd ACS National Meeting, Philadelphia, PA, 08/21/16–08/25/16, *poster*.
12. **Nowaczyk, Jordan N.**; Nahar, Lamia; Arachchige, Indika U.* “Synthesis and Characterization of Ag/Pd/Au Nanoparticle and Hollow Nanoparticle Aerogels” ACS Virginia Section Meeting: Undergraduate Poster Session, Charlottesville, VA, 04/15/16, *poster*.
13. Esteves, Richard J.; Ho, Minh Q.; Arachchige, Indika, U.* “Composition Tunable Absorption and Emission Properties of Ge_{1-x}Sn_x Alloy Nanocrystals” *International Symposium on Clusters and Nanomaterials*, Richmond, VA, 10/26/15–10/29/15, *poster*.
14. Ho, Minh; Esteves, Richard J.; Arachchige, Indika U.* “Colloidal Synthesis and Characterization of Size Tunable, Luminescent Zn₃P₂ Nanocrystals” 250th ACS National Meeting, Boston, MA, 08/16/15–08/20/15, *oral*.
15. Esteves, Richard J.; Arachchige, Indika U.* “Semiconducting Group IV Quantum Dots for Tunable Bandgaps” 250th ACS National Meeting, Boston, MA, 08/16/15–08/20/15, *oral*.
16. Gao, Xiaonan; Arachchige, Indika U.* “Sol-Gel Methods for the Assembly of Noble Metal Nanoparticles into Metallic Aerogels” 250th ACS National Meeting, Boston, MA, 08/16/15–08/20/15, *oral*.
17. Nahar, Lamia; Arachchige, Indika U.* “Sol-Gel Method: An Advanced Technique to Obtain 3-D Superstructures of Metal-Semiconductor Hybrid Nanoparticles.” 250th ACS National Meeting, Boston, MA, 08/16/15–08/20/15, *oral*.
18. Gao, Xiaonan; Nahar, Lamia; Arachchige, Indika U.* “Porous Conducting Superstructures of Metal Colloids: Noble Metal Aerogels” 250th ACS National Meeting, Boston, MA, 08/16/15–08/20/15, *oral*.
19. Kulugamma, Ranmohotti G. S.; Gao, Xiaonan; Arachchige, Indika U.* “Salt-Mediated Assembly of Bimetallic Nanoshells into Monolithic Aerogel Frameworks” 46th Central Regional Meeting of the American Chemical Society, Grand Rapids, MI, 05/27/15–05/30/15, *poster*.
20. **Thomas, Patricia**; Esteves, Richard J.; Arachchige, Indika U.* “Developing Synthetic Controls for Monodisperse Ge_{1-x}Sn_x Alloy Nanocrystals” *Annual Biomedical Research Conference for Minority Students*, 11/12/14–11/15/14, San Antonio, TX, *oral*.
21. Luong, Thi T. H.; Gao, Xiaonan; Ranmohotti, Kulugamma G.; Arachchige, Indika U.* “Non-Ordered Metal Hollow Particle Superstructures: Metal Aerogels” 65th Southeast Regional Meeting of the American Chemical Society, Atlanta, GA, 11/13/13–11/16/13, *oral*.
22. Esteves, Richard J.; Arachchige, Indika U.* “Bandgap Engineering of Germanium Nanoparticles Through Tin Alloying and Quantum Confinement Effects” 65th Southeast Regional Meeting of the American Chemical Society, Atlanta, GA, 11/13/13–11/16/13, *oral*.

23. Gao, Xiaonan; Arachchige, Indika U.* “Sol-Gel Assembly of Silver Nanoshells into Aerogel Frameworks” *65th Southeast Regional Meeting of the American Chemical Society*, Atlanta, GA, 11/13/13–11/16/13, *oral*.
24. Luong, Thi T. H.; Gao, Xiaonan; Arachchige, Indika U.* “Sol-Gel Assembly of Ag Hollow Particles into Ag Aerogels” *ACS Virginia Section Meeting: Undergraduate Poster Session*, Charlottesville, VA, 04/19/13, *poster*.
25. Kulugamma, Ranmohotti G. S.; Gao, Xiaonan; Arachchige, Indika U.* “Self-Supported Assembly of Hollow Metallic Spheres into Aerogel Frameworks” *245th ACS National Meeting*, New Orleans, LA, 04/07/13–04/11/13, *oral*.
26. Esteves, Richard. J.; Arachchige, Indika, U.* “Composition Tunable Absorption and Emission Properties of Ge_{1-x}Sn_x Alloy Nanocrystals” *64th American Chemical Society Southeastern Regional Meeting*, Raleigh, NC, 11/14/12–11/17/12, *poster*.
27. Gao, Xiaonan; Kulugamma, Ranmohotti G. S.; Arachchige, Indika U.* “Sol-Gel Methods for the Assembly of Hollow Metallic Spheres into Metal Aerogel Frameworks” *64th American Chemical Society Southeastern Regional Meeting*, Raleigh, NC, 11/14/12–11/17/12, *poster*.
28. Arachchige, Indika U.; Brumbach, Michael; Martinez, Jennifer,* Ivanov, Sergei “New Synthetic Routes for the Preparation of Fluorescent Metal Nanoclusters” *63rd Southeast Regional Meeting of the American Chemical Society*, Richmond, VA, 10/26/11–10/29/11, *oral*.

INVITED SEMINARS PRESENTED AT UNIVERSITIES AND NATIONAL MEETINGS (past ~5 years)

1. Arachchige, Indika U. “Non-ordered Noble Metal Nanoparticle Superstructures: Aerogels for Enhanced Chemical Sensing and Electrocatalysis” *Symposium NM3: Aerogels and Aerogel-Inspired Materials, Materials Research Society Spring Meeting*, Phoenix, AZ, 04/17/17-04/21/17.
2. Arachchige, Indika U. “Colloidal Synthesis and Exciton Carrier Dynamics of Group IV Alloy Nanocrystals: An Experimental and Theoretical Study” *Department of Chemistry, Old Dominion University*, Norfolk, VA, 03/02/2017.
3. Arachchige, Indika U. “Colloidal Synthesis and Exciton Carrier Dynamics of Group IV Alloy Nanocrystals: An Experimental and Theoretical Study” *Department of Chemistry, George Washington University*, Washington D. C., 09/30/2016.
4. Arachchige, Indika U. “Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures” *Department of Chemistry, Georgetown University*, Washington D. C., 03/17/2016.
5. Arachchige, Indika U. “Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures” *Department of Chemistry, Western Carolina University*, Cullowhee, NC, 10/02/2015.
6. Arachchige, Indika U. “Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures” *Department of Chemistry, George Mason University*, Fairfax, VA, 09/17/2015.
7. Arachchige, Indika U. “Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures” *Department of Chemistry, James Madison University*, Harrisonburg, VA, 09/10/2015.

8. Arachchige, Indika U. "Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures" *Department of Physics, Virginia Commonwealth University*, Richmond, VA, 04/10/2015.
9. Arachchige, Indika U. "Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures" *Department of Chemistry, University of Mary Washington*, Fredericksburg, VA, 03/27/2015.
10. Arachchige, Indika U. "Synthesis and Structure-Property Elucidation of Group IV Semiconductor Nanocrystals and Metal Hollow Particle Superstructures" *Department of Chemistry, Duquesne University*, Pittsburgh, PA, 03/20/2015.

PROFESSIONAL SOCIETY MEMBERSHIPS

- Sigma Xi
- American Chemical Society (ACS)
- Materials Research Society (MRS)
- PHI LAMBDA UPSILON (National Honorary Chemical Society)

DEPARTMENT, COLLEGE, AND COMMUNITY SERVICE

A. Internal Service

A.1 Department of Chemistry

- Chair of Member of Graduate Recruiting Committee, 2017-present
- Member of the Physical Chemistry Faculty Search Committee, 2018/2019
- Member of the third year review committee, Dr. Sherif Moussa
- Member of Graduate Recruiting Committee, 2011-2016
- Member of the High School Chemistry Committee, 2015-2017
- Member of the Nanoscience Faculty Search Committee, 2014/2015
- Member of the Chemistry Department Safety Committee, 2012/2013
- Recording of Faculty Meeting Minutes, 2011-2013 continuously
- Current member of 20 doctoral dissertation committees within the chemistry department
- Past member of 21 doctoral and master's thesis committees, 2012-2016
- Outside examiner on 4 doctoral or master's thesis committees (Engineering and Physics)

A.2 College of Humanities and Sciences (CHS)

- Member of the CHS Faculty Council, 2016-2019
- Member of the promotion and tenure committee, Dr. Patrick H. Woodworth (Physics)
- Alternate member of the VCU Faculty Senate, 2016/2017
- Reviewer, VCU Presidential Research Quest Fund (PeRQ)
- Reviewer, Undergraduate Research Opportunities Program (UROP)
- Reviewer, CHS-Baldacci Student Experiential Learning Endowed Fund
- Reviewer, Dean's Scholarship Awards of the College of Humanities and Sciences

B. External Service

1. Review of Proposals

- Panel Reviewer: NSF-Division of Materials Research (DMR): Electronic and Photonic Materials (EPM) and Solid State and Materials Chemistry (SSMC) programs.

- Ad-hoc Reviewer: NSF- Solid State and Materials Chemistry (SSMC) and Metals and Metallic Nanocrystals (MMN) programs.
 - Ad-hoc Reviewer: NSF-Centers of Research Excellence in Science and Technology (CREST), Research Infrastructure for Science and Engineering (RISE), and Broadening Participation Research (BPR) in STEM Education programs.
 - Ad-hoc Reviewer: European Research Council: Synthetic & Materials Chemistry.
 - Ad-hoc Reviewer: Swiss National Science Foundation (SNSF): Division of Mathematics, Physical and Engineering Sciences.
 - Ad-hoc Reviewer: American Chemical Society-Petroleum Research Fund.
 - Ad-hoc Reviewer: Commonwealth Research Commercialization Fund (Virginia, CRCF).
 - Ad-hoc Reviewer: NASA and PRESTIGE Postdoctoral Research Programs.
- 2. Editorial Board Memberships**
- Member of the board of editors for JSM Nanotechnology and Nanomedicine, the Journal of Advances in Chemical Science, and International Journal of Nano-studies & Technology.
- 3. Review of Manuscripts for (~15-20 papers/year)**
- Journal of the American Chemical Society, Journal of Physical Chemistry, Chemistry of Materials, ACS Nano, Nano Letters, Inorganic Chemistry, Industrial & Engineering Chemistry Research, Langmuir, Nature Chemistry, Nature Nanotechnology, Journal of Materials Chemistry, Physical Chemistry Chemical Physics, Chemical Communications, Dalton Transactions, Advanced Materials, Advanced Functional Materials, Colloids and Surfaces A, and Journal of Solid State Chemistry.
- 4. Community Service/Outreach (2013-present)**
- Organizer/Chair of Summer Research Experience for Educators and Students (SREES) program. The objective of this eight weeks long summer research program is to educate economically disadvantaged high school students and teachers on scientific research by actively participating them in nanoscience research projects at VCU Chemistry laboratories. To date, two high school teachers and five high school students were hosted through this initiative in Dr. Arachchige's lab (2013-present).
- 5. Member of the Organizing Committee for**
- Co-organizer of the STEM Research Day at Richmond Public Schools (Martin Luther King Jr. Middle School, Richmond, VA, 03/25/14).
 - Judge for Virginia Junior Academy of Science Symposium, Richmond, VA (05/15/14).
 - Judge for Chesapeake Bay Governor's School Science Symposium (03/15/14).
- 6. Presider at National and Regional American Chemical Society (ACS) Meetings**
- Nanoscience Synthesis Session Chair at 252th ACS National Meeting (Philadelphia, PA); Colloids and Surface Chemistry Session Chair at 250th ACS National Meeting (Boston, MA); Nanoscience Synthesis Session Chair at 245th ACS National Meeting (New Orleans, LA); and Chemistry of Materials Session Chair at 65th American Chemical Society Southeastern Regional Meeting (Atlanta, GA).

RESEARCH COLLABORATIONS (Name; Institution; and the Nature of Collaboration)

- Prof. Ümit Özgür; Dept. of Electrical Engineering, VCU; Ultrafast carrier dynamics of quantum dots.
- Prof. Denis Demchenko; Dept. of Physics, VCU; Computational electronic structure simulations.
- Prof. Arun Subramanian; Dept. of Mechanical Engineering, VCU; Nanocrystalline Li ion batteries.
- Prof. Massimo Bertino; Dept. of Physics, VCU; Raman Spectroscopy.
- Prof. Sarah Rutan; Dept. of Chemistry, VCU; Chemometric analysis of Raman spectra.
- Prof. Shanaka Wijesinghe; Dept. of Pharmacy & Pharmacotherapy, VCU; Raman analysis of lipids.
- Prof. Channa De Silva; Dept. of Chemistry, Western Carolina University; Theoretical studies of nanoscale materials and antibacterial studies on plasmonic nanoparticles and aerogel materials.
- Prof. Ram Gupta; VCU Engineering; Nanomaterials for photocatalytic water splitting.
- Prof. James McLeskey; Dept. of Physics, Randolph-Macon College; Solar cells/diodes fabrication.
- Prof. Prashanth Upadhyya; Dept. of Physical Sciences, Indian Institute of Science Education and Research (IISER), Kolkata; India; Steady state and ultrafast absorption and emission spectroscopy.