NOMINATION PORTFOLIO
UNIVERSITY SYSTEM OF GEORGIA
2021 FELTON JENKINS, JR. HALL OF FAME FACULTY AWARDS

Arpita Saha, PhD, Associate Professor

Department of Chemistry and Biochemistry
College of Science and Mathematics (COSM)

November 2020

Contents

GEORGIA SOUTHERN UNIVERSITY

ACADEMIC AFFAIRS
POST OFFICE BOX 8022
STATESBORO, GEORGIA 30460-8022
PHONE: 912.478.5258
FAX: 912.478.5279

OFFICE OF THE PROVOST AND VICE PRESIDENT

October 22, 2020

Dear Selection Committee,

With great pleasure, I write to nominate Dr. Arpita Saha, an Associate Professor of Chemistry and Biochemistry, for the Felton Jenkins, Jr. Hall of Fame Faculty Award. Dr. Saha's efforts to improve undergraduate STEM education inspire her colleagues, as you will read in her recommendation letters. While Southern is privileged to have many outstanding teachers dedicated to improving student learning, I believe Dr. Saha is uniquely deserving of this award because her impact as an innovative educator extends far beyond her own classroom. Dr. Saha's tireless efforts have changed the student experience not only in her own courses or department but in her entire college. She truly sets an example of teaching excellence for her colleagues.

Dr. Saha advocates strongly for project-based learning that involves undergraduates early and often in research, which, as we know, is a high impact practice. As she has adopted existing courses in her department, she has invested a great deal of effort to redesign them around project-based learning that allows students to experience the realities of chemistry research. Identifying the need for a more advanced research opportunity, Dr. Saha re-designed her upper level Advanced Inorganic Chemistry lab course to allow students to engage in depth with peer-reviewed sources and work in small groups to conduct their own research.

The effects of Dr. Saha's exceptional dedication to the undergraduate learning experience quickly spread to her entire department as she spearheaded the effort to create new bachelor and doctoral programs in Environmental Science. As part of this new program of study, Dr. Saha developed an advanced course in Environmental Chemistry. Her commitment to developing student critical thinking skills through engagement in research enhances the undergraduate experience in chemistry and prepares students to succeed in their educational and professional endeavors.

While her teaching effectiveness at both the course and department levels alone should impress, I will echo each of her colleagues in noting that Dr. Saha's greatest accomplishment lies in her development and implementation of IFREE, an initiative that introduces first-year students to the process of conducting research in STEM fields. Notably, Dr. Saha's unflagging work to advance this program ensured that it was adopted not only in her own classroom or department but by the entire College of Science and Mathematics, ensuring that all undergraduates in the college will have an opportunity to engage in research that brings to life their chosen disciplines.

Teachers who positively impact the lives of their students deserve to be recognized, but teachers who positively impact the lives of students who may never set foot in their classrooms deserve something more: a place in the "Hall of Fame." Dr. Aprita Saha certainly merits this recognition.

Sincerely,

Carl L. Reiber, Ph.D.
Provost & Vice President for Academic Affairs

GEORGIA SOUTHERN UNIVERSITY

October 29, 2020

USG Office of Academic Affairs
Felton Jenkins, Jr. Hall of Fame Faculty Award
Selection committee

Dear selection committee,

I am writing today to lend my enthusiastic support for the nomination and selection of Dr. Arpita Saha, Associate Professor of Chemistry at Georgia Southern University, for the Felton Jenkins, Jr. Hall of Fame Faculty Award.

Why is Dr. Saha the perfect recipient for this award?
From her CV and other documents, you can see that she is very accomplished as a teacher and a mentor. How do these many accomplishments impact students? Dr. Saha impacts students by being a strong, enthusiastic, engaging, authentic, and highly sought-after mentor. From mentoring undergraduate research students to creating professional development workshops for students, Dr. Saha exemplifies what it means to be a scientist. She exudes stellar technical skills, communicates well, engages in professional development, and values diversity, and expects the same from her students. Dr. Saha mentors teachers and high school students through the ACS Science Coaching program and the Science Olympiad. She is a well-rounded and committed mentor and role model for the next generation of STEM professionals.

Dr. Saha also impacts students by embracing the use of the best practices for inclusive teaching in her classroom. Dr. Saha creates a safe student-centered educational environment for students of all backgrounds, identities, genders, and races. Her teaching is grounded in the scholarship of teaching and learning and reflects best practices in STEM education. She strives to motivate all students through the use of educational resources designed to level the playing field, such as open educational resources, active classrooms, early undergraduate research, and research-based learning experiences. Dr. Saha embraces innovative technologies and pedagogies which engage students and helped her transition rapidly and creatively into the new COVID environment with the same level of engagement. Outside of the classroom, Dr. Saha emerged as a leader in our College of Science and Mathematics Diversity and Inclusion Collaborative and our Alliance for Women in STEM. Dr. Saha is committed to diversifying her discipline through action by educating peers and students on issues of diversity and bias in STEM.

I enthusiastically support Dr. Saha for the Felton Jenkins Jr. Hall of Fame Award. She is truly one of a kind and an asset to Georgia Southern University and the University System of Georgia.
Sincerely,

Dr. Delana A. Gajdosik-Nivens
Dean and Professor of Chemistry

COLLEGE OF SCIENCE AND MATHEMATICS
Statesboro Campus: P.O. BOX 8044 • STATESBORO, GA 30460 • 912-478-5111
Armstrong and Liberty Campus: SCIENCE CENTER SUITE 1505, 11935 ABERCORN STREET, SAVANNAH, GA 31419• 912-344-3330
cosm@georgiasouthern.edu

October 29, 2020

From: Will Lynch, Department Chair, Chemistry and Biochemistry
To: The USG Office of Academic Affairs Felton Jenkins, Jr. Hall of Fame Faculty Awards' Selection Committee

Re: Dr. Arpita Saha – Letter of Support

It is with great pleasure that I nominate Dr. Arpita Saha, Associate Professor of Chemistry for the USG Felton Jenkins, Jr. Hall of Fame Faculty Awards 2020-21. Dr. Saha will be an exceptional choice for this recognition due to her unwavering commitment to our students and programs. She has a very successful track record of supporting student success in and out of the classroom by adaptive teaching pedagogies characterized by creating a supportive and nurturing environment for our students to achieve their potential.

I feel that I have a noteworthy position in supporting Dr. Saha both as her Department Chair and as her disciplinary peer. Since joining our department in 2011, Dr. Saha has made significant contributions to the program in a short period of time in her teaching and mentoring endeavors. She has stepped in and taught a variety of classes in our department and program at both the undergraduate and graduate level. She has supervised M.S. in Applied Physical Science students as well serving as an excellent undergraduate and graduate research mentor. Dr. Saha has quickly established herself as a motivated and committed teacher. Her teaching was motivated by improving the learning outcomes of her students. Specific areas of note.

Freshman Research Program (IFREE). Dr. Saha has spearheaded an innovative program on the Southern campus that engages freshman science majors in research. Data has shown that the IFREE program enhances student success, retention and progression. Essentially the program cohorts students and gives them an engaging research activity during general chemistry to infuse them into the program and an enhance faculty interaction early in their academic careers. Dr Saha has been a leader in this initiative including securing internal support and seeking to expand this via external grants.

Course-Based Undergraduate Research Experience (CURE). Similar to IFREE, the CURE initiative is a research based experience in an upper division major's course. Again, implementing a high impact practice to support student success above and beyond the normal scope of faculty instruction.

A Commitment to Being an Outstanding Mentor for our Students. Dr. Saha early on had the makings of an excellent scholar in inorganic chemistry and this has been evidenced by the publications that have resulted from her work. However, the most important aspect of this is the mentoring of our students, both on the undergraduate and graduate level. Dr. Saha has an exceptional commitment to scholarly research that involves students while answering critical chemical questions. Mentoring in chemical research is one of the purest forms of teaching, and Dr. Saha is committed to this activity and peer reviewed outcomes. This is evidenced by her publication record at Georgia Southern and she clearly excels in this area as well.

In short, Dr. Saha is a great young faculty member. Her activities are centered on the inclusion of students in a variety of experiential activities both in the classroom and in the research arena. She exemplifies the outstanding teacher and mentor that the University System of Georgia aspires to celebrate and acknowledge.

Will E. Lynch,
Professor of Chemistry, Department Chair

Department of Chemistry and Biochemistry
Georgia Southern University – Savannah Campus, Savannah GA 31419 912-344-3144
wlynch@georgiasouthern.edu

GEORGIA SOUTHERN UNIVERSITY
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

P.O. BOX 8064
STATESBORO, GEORGIA 30460-8064
TELEPHONE (912) 478-5681
FAX (912) 478-0699
http://cosm.georgiasouthern.edu/chemistry/

September 29, 2020

Dear Colleagues,

Re: Dr. Arpita Saha

Dr. Arpita Saha is a conscientious teacher-scholar who is as thoughtful about the content of her professional work as she is about the individuals she is training. She is a highly skilled scientist and educator who excels in every aspect of her work. For her exceptional work as a teacher-scholar, she has earned recognition as *with the 2020 Georgia Southern (GS) University Academic Excellence Award and as a 2020-2022 University System of Georgia (USG) Chancellor's Learning Scholar*. She is truly deserving of the USG Felton Jenkins Jr. Hall of Fame Faculty Award.

Dr. Saha and I are colleagues in the Georgia Southern (GS) Chemistry and Biochemistry Department. She joined GS in 2012 as a visiting Assistant Professor, became a tenure-track Assistant Professor in 2013, and earned her promotion to Associate Professor in 2019. She is known for her work-ethic, brilliance and savvy. In addition, to implementing creative and effective techniques in instruction in her classrooms, she is positively impacting the careers of students and faculty outside of her courses. Through programming and securing collaborations, Dr. Saha ensures that her achievements are shared with the wider STEM community through presentations and publications. Admirably, she is constantly writing *and winning* grant proposals to fund her ideas. She has been on an upward trajectory since joining our department and time and time again, she has "wowed" us with her ideas and her ability to bring them into existence. Here, I have provided reflections on two of Dr. Saha's recent achievements which illustrate the remarkable impact she has on students and colleagues:

Project-Based Courses: Dr. Saha challenges her students to grow in the critical thinking skills and at every turn, she affirms their identities as scientists in service to their communities. At GS, Dr. Saha has taught a wide scope of courses. Notably, she re-worked the laboratory portion for her upper level Inorganic Chemistry Advanced Inorganic Chemistry (CHEM 3300) course and from scratch, developed Environmental Chemistry (CHEM 5233/5233G), an upper level and graduate course.

In the Advanced Inorganic Chemistry laboratory Dr. Saha implemented Course-based Undergraduate Research Experience (CURE). Her execution and success with CURE is a *tour de force*. For a semester, the students *are researchers*. Dr. Saha guides students in the development of their questions and plans for answering those questions. This is all the more impressive because, as the students are designing their plans, they are also learning to read and comprehend articles from peer-reviewed journals, and they are learning about the fundamentals of inorganic chemistry. This is hard work for an instructor with over 40 students. The student work in groups where, for the most part, no two groups are ever at

the same point in the development of their projects. In addition, because it is research, successful projects as defined by the traditional ways of teaching such courses, are not guaranteed. As such, it requires that Dr. Saha is meeting frequently with her students in small groups and also coaching them through "disappointing" results. However, at the end of the course, the students are able to say that though hard, they grew in their critical thinking skills and their self-efficacy, and they enjoyed the opportunity to be 'researchers' for a semester. Dr. Saha has had similar success with Environmental Chemistry, also a project-based class where students are challenged to consider the scientific, political and social factors that come with environmental concerns.

First-Year Research Experience: Dr. Saha's influence extends beyond her courses. An example is the first-year research experience initiative (IFREE) for the College of Science and Mathematics (COSM). In order to bring IFREE into existence, Dr. Saha and her collaborators were relentless in presenting their case to the COSM Dean, the COSM Associate Dean of Research, the COSM department Chairs, and stakeholders in the College of Education. *Admirably, to their credit, IFREE started in 2019 with funding from the GS College of Education SEED grant and the University Systems of Georgia STEM IV grant.*

Studies have proven that early involvement in research promotes persistence in STEM. IFREE is a two-semester program for first-year students. In this program, the students engage in a FYE course that prepares them for pursuing research and, according to their interests, matches them with a COSM group. It is important to note that this is a college-wide initiative that benefits both students and faculty as the goal is to equip the students for the pursuit of research over the long-term, until graduation. This is great for the students as long-term research involvement will make them very competitive candidates for graduate school. In turn, the faculty benefit from gaining mentees who are already comfortable with reading journal articles and presenting research, and will be highly productive because of that long-term commitment.

Other avenues through which Dr. Saha's impact extends beyond her classes include the creation of Open Educational Resources (OER) for the Comprehensive General Chemistry course (*grant-funded*), the development of a new BS & doctoral degree program in Environmental Science, her involvement in designing hands-on activities for children in Statesboro and surrounding communities, and her role as a research-mentor and workshop-host for the Chemistry and Biochemistry departments undergraduate research experiences program (CEMITURE).

Overall, Dr. Saha is an amazing teacher-scholar who from day one at GS stood out for her brilliance, creativity, dedication and discipline. She considers both the content of her work as well as the people she is training. She is savvy in that she is continuously sharpening her skills and winning grants to fund her ideas. She is an outstanding colleague. As she sharpens her skills, she is helping and challenging others to do the same. I cannot say enough great things about Dr. Saha. Each and every aspect of her work is permeated by excellence.

Sincerely,

Karelle Aiken, PhD
Professor of Chemistry & Biochemistry, Georgia Southern University

GEORGIA SOUTHERN UNIVERSITY
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

P.O. BOX 8064
STATESBORO, GEORGIA 30460-8064
TELEPHONE (912) 478-5681
FAX (912) 478-0699
http://cosm.georgiasouthern.edu/chemistry/

Dear Selection Committee, October 19, 2020

It is my honor to write a letter of support for Dr. Arpita Saha for the USG Felton Jenkins, Jr. Hall of Fame Faculty Awards. Dr. Saha has established herself over the past several years as a leader in the development of academic excellence opportunities for our students. She has recently been awarded a University Academic Excellence Award and has been selected as a USG Chancellor's Learning Scholar for 2020-2022. Her multiple projects have impacted many students and have led to a variety of enriching experiences for them.

I'm a long-time faculty member in the Chemistry Department, responsible mostly for teaching and coordinating the Principles of Chemistry courses. I mostly work with first-year students who are new to our campus and new to the collegiate life of a science major. It is these students who are most impacted by some of Dr. Saha's most recent work.

The IFREE Freshman Research Program is a program that Dr. Saha implemented on our campus. This innovative research program begins in First Year Experience (FYE) where students self-identify an interest in research and sign up to take a common FYE section where Dr. Saha slowly introduces them to the world of undergraduate research. When FYE is finished, these students are matched to research labs and the program follows up with additional training on writing skills, presentation, and the process of applying to graduate schools. It's a significant undertaking and one that Dr. Saha was eager to take on. It's a program that is ideal for our students who have an interest in chemistry and in research, but don't know how to get started. This program provides valuable opportunities for our students. Many faculty are hesitant to take on such a time-intensive effort, but Dr. Saha saw the value of it and worked to bring it about.

Dr. Saha's passion for kindling undergraduate research opportunities extends to the upper level labs as well where she teaches Advanced Inorganic Chemistry. She was instrumental in developing a CURE (Course-Based Undergraduate Research Experience) for the class. Her upper level lab experience is a giant research project in which all of her students participate in generating real research data while also meeting the learning objectives of the lab section for the course. Students who haven't had undergraduate research get the chance to participate in a research project. This is a creative way to expose our chemistry majors to research. Even the students who skip out on the traditional research labs still get the experience when they complete the CURE.

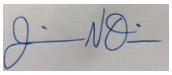
Dr. Saha has also done significant work in the development of our summer research program which includes students from our campus as well as high-ability students from other campuses. She has worked with a group of faculty on fine-tuning the training these students receive and has applied much of what she has learned here to her other student research initiatives.

Across our campus Dr. Saha has contributed to academic excellence through her work on diversity and inclusion. She works tirelessly to promote women and minorities in the STEM disciplines. She's in a good place to do this work. Our department is fortunate to have a strong representation of both women and minorities. While our campus as a whole has a lot of work to do to promote diversity and inclusion, Dr. Saha's work is helping to promote the work that we've already done and she is helping the campus to build a foundation for the work that we all need to continue.

Also of note is Dr. Saha's work on the Chemistry Department award committee. She has been chair of this committee for years and I've watched her identify and encourage many of our faculty to step up and apply for awards. She has provided genuine support and encouragement for us and many of us are grateful to her for her recognition. It is fitting that she is stepping up to apply for an award now that is so fitting for her contributions.

In summary, I've been quite impressed with the work Dr. Saha has done in her time with us. Her promotion of academic excellence in the development of research opportunities for undergraduates is most impressive. I highly recommend her for this honor!

Thank you and sincerely,



Jessica Orvis, Associate Professor of Chemistry, Georgia Southern University.

[Saha Webpage]

Arpita Saha

Associate Professor, PhD Phone: 352-672-0151 (Cell)
Department of Chemistry and Biochemistry E-mail: asaha@georgiasouthern.edu
Georgia Southern University (GSU); Statesboro, GA 30460 Nationality: US Citizen

a. Professional Preparation

2002	Presidency University, Kolkata, India	B.S.
2004	Indian Institute of Technology (IIT) Kanpur, India	M.S.
2011	University of Florida, Gainesville, FL, USA	Ph.D.

b. Appointments

2019-Present	Associate Professor, Dept. of Chemistry & Biochemistry, GSU, Statesboro, GA
2013-2018	Assistant Professor, Dept. of Chemistry & Biochemistry, GSU, Statesboro, GA
2012-2013	Visiting Assistant Professor, Dept. of Chemistry, GSU, Statesboro, GA
2012	Visiting Professor, Georg-August-Universität Göttingen, Germany
2011-2012	Assistant Professor, Dept. of Chemistry, Saginaw Valley State U., Michigan
2005-2011	Teaching and Research Assist., Dept. of Chemistry, U. of Florida, Gainesville, FL
2004-2005	Research & Development Project Assist., Dept. of Chemistry, IIT Kanpur, India
2003	Internship, Dept. of IPC, Indian Institute of Science (IISc) Bangalore, India

c. Notable Contribution

Pioneer of launching *COSM-IFREE* Freshmen Research Program (2019-present)
Developed Open Educational Resources *(OER)* for Comprehensive General chemistry (2019-20)
Implementing *CURE* lab for Advanced Inorganic Chemistry (2019-present)
Panel Reviewer for NSF-Graduate Research Fellowship Program (2020-present)
Proponent of Inclusive Excellence and serving steering committees for
- *GS COSM Diversity & Inclusion Collaborative (2019-present)*
- *GS Alliance for Women in STEM (2020-present)*
- *GS Commission of Women (2018-present)*
- *GS President's Diversity Advisory Council* (alternate) *(2019-present)*

Serving COSM committee for developing new BS & Doctoral Degree for Environmental Science
Member of General Chemistry assessment committee (2017-present)
Member of COSM Award Committee (2018-2020)
Chair of Dept. of Chemistry & Biochemistry Award Committee (2014-2020)
NSF-REU Mentor, Facilitator of CEMITURE-UG Summer Research Program (2018-present)
Nominated and elected for GS Senate Alternate (2015-2016)
Symposium Organizer at SERMACS Conference (2019)
Organizer of Dreyfus Lecture Series at COSM (2019)
Member of GS Eagle Preview (Open House, 2012-present)
Associated with GS Multi-Cultural Center, organized events for International Program (2014-16)
Member of American Chemical Society (2008-present)
Member of Council of Undergraduate Research (2013-present)
Member of Ionic VIPEr (2014-present)
Member of Editorial Board of Int. Journal of Magnetics and Electromagnetism (2018-present)
Member of American Men and Women of Science (AMWS)(2019-present)

d. Professional Awards & Accomplishments (selected)

2020 Awarded **GSU Academic Excellence Award**
2020 Nominated and awarded as **USG Chancellor's Learning Scholar** for 2020-2022
2020 Awarded **SoTL Fellowship** at GSU
2020 Nominated for COSM Excellence in Service Award at GSU
2019 Accepted into **ACS Science Coaches Program** organized by AACT & ACS
2019 Awarded **Jean Dreyfus Lectureship** Grant for Undergraduate Institution by Camille and Henry Dreyfus Foundation
2018 Received certificate for Teaching and Developing Online Course by CTE at GSU
2018 Received certificates for outstanding contribution in reviewing for two journals, *Inorg. Chim. Acta.* and *J. of Molecular Structure*
2018 Awarded ACS Certificate of Merit for outstanding first oral presentation by the division of Environmental chemistry in 255th ACS national conference at New Orleans, LA
2015 Awarded a certificate for Affiliate Faculty, Institute for Interdisciplinary STEM Education, i^{2}STEM^e
2014 Accepted in and awarded to participate an NSF granted workshop, VIPEr: Bioinorganic Applications of Coordination Chemistry at Northwestern University, Evanston, IL
2013 Awarded a certificate for 'Teaching in Higher Education' in 2013 at GSU
2013 Awarded a certificate on completion of the 2013 Teaching Academy at GSU

e. Dissemination

- **7** research articles with **9** UG research students and **2** MS students as co-authors and **4** electronic education articles on VIPEr (Virtual Inorganic Pedagogical Electronic Res.)
- **15** conference proceedings including **6** in teaching and learning conferences as PI
- **23** students' presentations (peer-reviewed) at the regional and national conferences and **17** local conferences & meetings, **19** successful internal students' grants

f. Research Interests

- Inorganic and Materials Science; Environmental Chemistry; Chemical Education

g. Products (Selected)

Peer Reviewed Journal Articles (underline undergraduate, # graduate, *PI)

2020 Synthesis, structural variation, and magnetic properties of two polynuclear Mn-based complexes derived from 4,5-Bis(hydroxymethyl)-2-methylpyridin-3-ol, Brooke Harris, Nicholas Shumate, Kiana Moncur, Glory Onajobi, Michael Reagan#, Clifford W. Padgett, Eric T. Drew, Z. John. Zhang, **Arpita Saha***, *Inorg. Chem. Commun 121, 108226*
2018 Synthesis and characterization of two new mixed-valent Mn_6 complexes derived from a well-explored 2- hydroxymethyl pyridine along with the use of newly employed carboxylate ions. Michael Reagan#, Eric T. Drew, Z. John. Zhang, Clifford W. Padgett, Jeffery Orvis, **Arpita Saha*** *Inorg. Chem. Commun., 97,* 139
2018 Removal of a Potentially Hazardous Chemical, Tetrakis (Hydroxymethyl) Phosphonium Chloride from Water Using Biochar as a Medium of Adsorption. Simpo Rose Ogwang Akech#, Olajumoke Harrison, **Arpita Saha*** *Environ. Technology & Innovation,*12, 196
2017 Synthesis, characterization, computational study, and biological relevance of a family of isostructural, mononuclear Ln (Ln = Gd, Tb, Dy, Ho, Er) complexes containing pyridoxine, an essential ingredient of vitamin B6 enzyme. Caitlyn E. Stouder, Khairi J. Warren, Olivia

F. Perdue, Amanda L. Stewart, Clifford W. Padgett, Allison J. Amonette, **Arpita Saha*** *Inorg. Chim. Acta*, *464*, 172

2015 Hexacoordinate Ru-based olefin metathesis catalysts with pH-responsive N-heterocyclic carbene (NHC) and N-donor ligands for ROMP reactions in non-aqueous, aqueous and emulsion conditions. Shawna L. Balof, K. Owen Nix, Matthew S. Olliff, Sarah E. Roessler, **Arpita Saha**, Kevin B. Müller, Ulrich Behrens, Edward J. Valente and Hans-Jörg Schanz *Beilstein J. Org. Chem.*, *11*, 1960

2011 New Mixed-Valent Mn Clusters from the Use of *N, N, N′, N′* –Tetrakis(2-hydroxyethyl) ethylenediamine ($edteH_4$): Mn_3, Mn_4, Mn_6, and Mn_{10} **Arpita Saha**, Khalil A. Abboud, George Christou *Inorg. Chem.*, *50*, 12774

2011 Family of Double-Cubane Mn_4Ln_2 (Ln = Gd, Tb, Dy, Ho) and Mn_4Y_2 Complexes: A New Mn_4Tb_2 Single-Molecule Magnet. **Arpita Saha**, Mike Thompson, Khalil A. Abboud, Wolfgang Wernsdorfer, George Christou *Inorg. Chem.*, *50*, 10476

Peer Reviewed Electronic Articles (selected)

2014 Having fun with your own molecular models. **Arpita Saha** *VIPEr(Virtual Inorganic Pedagogical Electronic Resource)* *https://www.ionicviper.org/class-activity/having-fun-your-own-molecular-models*

Grants (Funded)

2020 University System Georgia (USG) **Chancellor's Learning Scholar** Fellowship Award for an amount of *$1500*: Principle Investigator (PI)

2020 Faculty Development Funding by Center of Teaching Excellence, GSU on "Transforming an Existing Traditional Inorg. Chem. Laboratory to Course Based Undergraduate Research Experience (CURE): **SoTL Fellowship**" for *$1000*: PI

2019 **USG STEM IV** Grant Award on "Faculty-Student Learning Communities to enhance academic mindset and undergraduate research opportunities for first-year students" for an amount of $150,000: Key Personnel

2019 **Jean Dreyfus Lectureship** for Undergraduate Institution by Camille and Henry Dreyfus Foundation for an amount of $18,500; PI

2019 **USG initiative, Affordable Learning Georgia (ALG)** Grant Award on Textbook Transformation Grants, Round Fourteen for an amount $18,500; Co-PI

2019 **COE-SEED** Grant Award on "Planned Progressive Pathway (P3): Increasing freshman student participation in conducting research (IFREE) (A collaborative effort between COE and COSM)" for an amount of $5500; Co-PI

2019 **NSF-REU** Award **C**ollaborativ**E** **M**ultidisciplinary **I**nvestigations **T**hrough **U**ndergraduate **R**esearch **E**xperiences (CEMITURE) (Award amount *$280,056*; Mentor)

2018 Travel Award at GSU by Faculty Development Committee for an amount of *$1500*; PI

2017 Research Scholarly Pursuit Funding Award by Faculty Research Committee FY18 at GSU on "Synthesis of Nanoscale Molecular Magnets as Digital Data Storage Devices and Quantum Processors" for an amount of *$4000;* PI

2014 **Sustainability Fee award** on "Assessment of Water Quality and Soil Carbon Sequestration to Ensure Environmental Quality at GSU Campus" for the Center of Sustainability at GSU for an amount of *$15,930;* PI

2014 **COSM Research Award** at GSU on "Syntheses and Study of Nano-scale Magnetic Materials" for an amount of *$1000;* PI

Reflective Statement on Teaching and Learning Philosophy

Faculty mentoring is my passion and I love every day nurturing possibilities, encouraging creative minds, and creating a safe space for belonging in STEM for every individual. Over the years I have realized the importance of building inclusive teaching practices in classroom since, many of them have yet to recognize the value of their unique talents and potential to navigate their learning outcome towards academic success. At GSU, a primarily undergraduate institution my principle strategies as a teacher are; assisting students' growth, cultivating critical thinking, inducing love for the subject, promoting communication skills, and endorsing active learning.

Effective & Inclusive Teaching Strategies: I consider my greatest challenge is to engage all students in the learning process and pique their interest in the subject of chemistry. My teaching style is very interactive, and I have always encouraged them to ask the question 'Why'! I incorporate several class activities, iClicker quick response, games, authentic examples, videos, animations, simulations, and analogies to boost their understanding in the subject. I am a big proponent of inclusive teaching & learning and have embraced several techniques in classroom to promote inclusive excellence. I make a conscious effort to include examples which can motivate students coming from all diverse ethnic & gender backgrounds to continue with STEM related fields for their career choices. I have created Open Educational Resources (**OER**) for general chemistry students (supported by USG-ALG grant) for better accessibility of resources from the beginning of the semester. It is very gratifying when students acknowledge the hard work and express an increase in interest in the topic of chemistry. In their own words *"I loved Dr. Saha's enthusiasm about each subject we covered. One could tell that she was obviously passionate about what she does and that knows about what she is teaching. Because of these qualities, it helped make her explanation of material simple, yet very informative."*

I have taught **10** different courses over the years at GSU. For my upper level Advanced Inorganic course (Chem 3300), I designed a brand-new laboratory experience for all my students in fall 2019. This was a discovery-based learning experience (**CURE**) to engage an entire class in a research question within the context of the course itself. Students were introduced to authentic research practices, discovery, collaboration, and iteration. The findings of these research work have been shared at SoTL conference. The experience was quite gratifying to see that students were genuinely interested to challenge themselves in pursuing research. In their words*, "The free-form style of the CURE labs was more intellectually engaging than some of the more structured, guided labs.",* In addition to assigning several homework and practice problems and providing regular feedback to facilitate the learning process, I promoted group activities in the class. These resulted in several interesting projects and student presentations. In their words, *"Going around campus for the symmetry scavenger hunt assignment was amazing. I won't forget that day".* All of which helped to create a mutually supportive and positive learning environment.

I find immense pleasure teaching/creating the graduate level course, Environmental Chemistry (Chem 5233G). I designed the course objective in a way which not only enables my students to learn about chemical processes concerning environment but also helps them to analyze a complex real-world problem and to find possible solution to it. I taught them to be efficient with literature search and to draw conclusions based on the data, and to present the key findings in both written and verbal form. I took them for field study for water, soil, and air quality measurement at GSU. In their words, *"The field-trips were pretty cool".* All these varied experiences enrich their understanding of environment and make them informed and more responsible global citizen. My role as a teacher is to facilitate growth and success for every individual. Student reviews have aptly pointed, *"She really takes time to make sure we are all on board".*

I encounter everyday how students facing imposter syndrome and believe in fixed mindset which truly hinder their academic success. I find one way to create a science identity is to mentor students effectively from the beginning of their college year until graduation. I have co-launched a new UG research program **iFREE** (Incorporation of Freshmen in Research for Early Experience) at COSM (supported by COSM Dean, USG STEM IV & COE-SEED grants) where the progression of freshmen students towards graduation is being monitored with strategic interventions through several professional development activities and assessments studies.

Mentorship Through Workshops: For summer REU program, I have taught several workshops on improving communication skills, hands-on training with instrumentation. For iFREE program, I have designed a 12-week long professional development series in spring 2020, and webinars in Fall 2020 which goes beyond the traditional classroom learning. The program addresses communication skills, scientific literacy, career preparation, strategies for successfully navigating different stages of a STEM profession, and hands-on training with instrumentation and resources commonly used by STEM professionals. Also, I enjoy several outreach activities with local schools and communities. E.g. **ACS Science Coach Program** has enabled me to design lesson plans and provide resources to infuse interest in young minds at local schools. I regularly mentor students to volunteer for **Science Olympiad**, **STEM Fest** and so on. Also, I have organized multiple workshops on promoting **diversity & inclusion** in classroom and everyday life.

Mentorship in Research: Supervising CHEM 4890 (UG Research credit), CHEM 7999 (MS Thesis) and NSF-REU at my research lab presents learning opportunities for undergraduate (UG) and master's students respectively. I have mentored **28** UG and **7** MS students and served **3** graduate thesis committees as PI at GSU. Training includes to perform literature searches, design experiments, safe use of instrumentation, and proper collection, presentation, and interpretation of data. I have spent additional times to aid with their critical writing skills which is reflected in **19** successful students' grants. I send my research scholars to disseminate research results which have resulted in **23** students' presentations (peer-reviewed), at the regional and national conferences and **17** local conferences & meetings and **7** peer-reviewed articles from GS. These experiences helped them to transition to careers in dental, pharmacy, graduate school including PhD/MS program and several companies related to chemical & biological processes or environmental monitoring.

Response to Pandemic and Future Direction: I had to re-evaluate my teaching best practices strategies since COVID-19 has disrupted all our lives and livelihood to create a safe and effective learning environment for all. I observed that students are truly struggling in this new normal to keeping up with the deadlines and engaging with the material effectively. I made sure to re-organize the instructional material to make them easily accessible/available all times and clearly laid out the expectation with guidance to complete the assignment on time. I also found that students are struggling with grasping information from recorded lecture using PowerPoint videos. So I created interactive lightboard videos & lecture videos using Kaltura and got positive feedback from students. I also created innovative assignments where students can engage effectively via remote learning, provided opportunities for collaboration using 'breakout room' feature in ZOOM along with ample ZOOM office hours options, accommodated students' numerous requests to ensure success and wellbeing of my students. Finally, I must say that I am a lifelong learner! My teaching and mentoring continuously grow with positive input from my peers and contributions from my UG and master's students. I always look out for ways to garner financial support to implement new ideas and strategies in teaching and learning. I empower students and colleagues around me, will continue organizing multiple workshops on inclusive and innovative best practices which I find most gratifying experience as a teacher-scholar.

Summary of Professional Development

Over the years, I have trained myself attending and leading several professional development courses at GS and beyond. All these experiences made me who I am today!

2021 Organizing and leading **6** workshops in spring of 2021 on *'Incorporating Inclusive Best Practices in Your Classroom'* as a USG Chancellor Learning fellow

2020 Organized workshop at COSM annual spring meeting on '*A View of Inclusive Excellence in STEM Through the Lens of Faculty Work*' (attendees ~200), GSU

2020 Organized Alliance for Women in STEM Multi-Campus Virtual Kickoff Event on *'Women + STEM = Great Possibilities; Successfully Navigating Perceptions & Presumptions'*

2020 Organized iFREE Webinar on *'How to write a mini research proposal'* for UG students

2020 Invited and participated at a panel discussion *on Let's Talk: Why I Came and Stayed* at 10th Faculty Professional Development Day, GSU

2020 Organized and led panel discussion at Women Leadership Series on *'Retaining Integrity & Fulfillment in Challenging Workplace Settings'* at Women & Gender Sexuality Studies Program

2020 Attended USG STEM IV Virtual Kick-Off & Summit Meeting, GA

2019 Organized and led several COSM Diversity and Inclusion meetings with intent of launching several inclusive excellence strategies (teaching, research, mentoring & service)

2019 Organized WLS Workshop on '*The Rewards and Challenges of Leadership in A Male-Dominated Field*" under Women & Gender Sexuality Studies Program

2019 Organized a leadership workshop for Alliance for Women in STEM and invited leading researcher *Professor Sharon Hammes-Schiffer* from **Yale University**

2019 Attended ALG Grant Implementation and Training Kick-Off Event Meeting at the Middle Georgia State University, Macon, GA

2019 Attended *USG Diversity & Inclusion Summit*, Macon, GA

2018 Attended several meetings, workshop organized by GS Commission of Women

2018 Attended CTE workshop on '*Diversity and Inclusion in the Classroom'*

2018 Attended Faculty Learning Community on 'Open Educational Resources' at CTE

2018 Attended COSM Active Learning Faculty Learning Community on *Integrated Design: Outcomes, Assessment, Student Centered Instruction*

2018 Received certificate for *Teaching and Developing Online Course* by CTE at GSU'

2017 Organized and led panel discussion on '*Perceptions and identities of international women in the workplace'* WLS under the Women and Gender Studies Program at GSU

2017 Attended several Round Table sessions of WLS on campus
1) *'Building Support Systems across Campus'*, 2) *'Work-Life Fulfillment'*

2014 Accepted and attended an NSF funded weeklong teaching workshop, *VIPEr Workshop: Bioinorganic Applications of Coordination Chemistry* at North Western University, Evanston, IL and published **4** electronic journals.

2014 Attended NSF Outreach Directorate for Biological Sciences Workshop at GSU

2013 Attended Teaching Academy Series (8 weeks) conducted by Center of Teaching & Learning (CTL) at GSU
1) Introduction to Learning-Centered Teaching, 2) Planning for Active Learning, 3) Student Motivation: Overcoming Obstacles to Learning, 4) Engaging Students in the Learning Process, 5) Creating Collaborative Learning Communities to Facilitate Learning, 6) Effective Tests: A Tool for Learning, 7) Effective Grading: A Tool for Learning, 8) Classroom Management

2013 Attended Teaching Philosophy, Portfolio Workshops conducted by CTL at GSU

2012 Attended Pearson Educational Forum on General Chemistry at New Orleans, LA

Summary of Innovative Practices of Academic Excellence

iFREE: In Fall 2019, I have been pioneering for launching a new undergraduate research program, Incorporation of Freshmen Research in Early Experience (iFREE) at COSM with active support of chairs and dean of COSM, along with my colleague. It took us one year to plan this program and I must say this has been the most rewarding and challenging academic practices that I have been a part of! IFREE program engages freshmen GS-COSM students in research experiences & professional development (PD) activities and guides them until their graduation. As a gateway course, I have designed a brand-new First Year Seminar (FYE) course (Who wants to be a scientist?) in Fall 2019 to recruit freshmen COSM majors for this program. Among first cohort, 62 % of the FYE class is enrolled in to IFREE program in Spring 2020 and engaged in research projects in multiple research streams in COSM. As a co-lead of the strategic team, I have developed PD activities for all iFREE research scholars in spring and fall of 2020 which will equip students with scientific writing, communication, and digital proficiencies. Students are also participating currently in Fall 2020 in a series of workshops that will hone their abilities in applying for research scholarships, graduate programs, increase scientific literacy, strategies to overcome failures, and awareness of academic integrity and imposter syndrome. As a response to the pandemic, many of these PD activities are turned into virtual training sessions. iFREE intends to explore how planned strategies can increase self-efficacy, persistence, and graduation rates among undergraduate (UG) students in STEM fields. This program is funded by **USG STEM IV** and COE internal seed grant.

CURE: I have developed and implemented a brand-new enquiry-based Advanced Inorganic Chemistry laboratory course in fall 2019, first time at the department of Chemistry & Biochemistry at GSU. This best practice strategy is based on a recent teaching protocol of a Course-based Undergraduate Research Experience (CURE) *(Science 2018, 360, 1417−1418)*. The design of the CURE course itself explicitly includes authentic research practices, discovery, collaboration, and iteration – necessary components for recreating an authentic research experience. Through CURE, students undertook several self-designed research projects (related to core interest of the course) to synthesize and characterize transition metal complexes for applications related to medicinal chemistry and material sciences. Students cultivated critical thinking abilities, carried multiple mini-research projects, and trained in several laboratory techniques, analytical instruments along with scientific writing and presentation skills through one semester laboratory experience. In order to measure the benefit of this new practice, with my colleague, CURE survey was conducted on students' understanding of the nature of scientific research, student motivation to pursue (or continue pursing) STEM, and student project ownership after completing this course (supported by **GS-SoTL Scholarship** award).

USG-ALG-OER: The importance to create affordable and robust major-oriented textbook materials for the UG students is well known. At the Statesboro campus, first time we created Open Educational Resources (OER) for the Comprehensive General Chemistry course (CHEM 1310) for engineering majors supported by **USG-ALG grant**. Most of the general chemistry textbooks are not written from the perspective of teaching Engineering Majors and there is no OER on general chemistry for Engineering Majors. Many students lack motivation to excel when the course objectives do not appear applicable to their academic major. This calls for a dire need for collection and reorganization of material suited to the students enrolled in the course. With team, I curated, re-shuffled and restructured foundational course materials based on learning objectives for each chapter from OER (https://www.oercommons.org/ including OpenStax) and provided guided and structured online supplemental materials (videos, examples, problem sets etc.) geared towards engineering majors hosted under the university library resources (found here).

UF UNIVERSITY of FLORIDA

College of Pharmacy

1225 Center Dr.
PO Box 100495
Gainesville, FL 32610-0000
352-273-6217

10/7/2020

Brooke Harris (Student)
College of Pharmacy
1222 SW 16th Ave, Apt C
Gainesville, Fl 32601

To Whom This May Concern,

I am currently a student in the College of Pharmacy at the University of Florida. I am writing this email to speak on the behalf of Dr. Aprita Saha and offer her my support for her nomination. Dr. Saha and I met in the Spring of 2016 and at that time, she was my lab professor for Inorganic Chemistry class. She was a wonderful, enthusiastic, and knowlegdable professor which lead me to ask to join her research team. By Fall of 2016, I was working for her as her research student exploring the initial reactivity and uses of metal/ligand compound. Dr. Saha and I also participated in outreach activities like the local Science Olympiad event, writing pubs and several science related conferences and presentations, such as SERMACS and the GSU Symposium.

As the lead professor of my research, Dr. Saha was by far, the best at what she did and I remembered spending 4 to 5 days a week in the lab working on my project, and whenever I was in the lab, Dr. Saha was made available to me in her office or via phone. She established a very warm and welcoming environment for her research students and she kept each of her projects very organized. Dr. Saha spent a good amount of details on each project by hosting weekly meeting in order to know the progress of each student's project. She also used that time to review the chemistry concepts being applied to our projects and allowed us to ask questions each step of the way. Dr. Saha was a crucial part of each student's success, but was always humble and joyful for each student's progress. By the end of my time with Dr. Saha, we had a completed project and she traveled with me to present at SERMACS in 2017 in Charlotte, North Carolina, and the work from that project is now in a publication as of Fall 2020.

Outside of my experience with Dr. Saha as a research professor, she was still an amazing influence on my life and on the community. Dr. Saha was instrumental in guiding my next steps after graduation and she helped me to study for the GRE and prepare my pharmacy school application. Her excellent letter of recommendation was a key factor in my acceptance and attendance into Pharmacy School. Dr. Saha's tutelage during my research lab experience at Georgia Southern University has expanded my knowledge and ability to handle complex problem solving for patient care.

Dr. Saha's community involvement was one of her strongest attibutes at Georgia Southern University. She participated in local events that were important to her as a scientist and as a person. Dr. Saha's most notable community affair was the Science Olypiad Crime Busters Event in Spring 2017. Dr. Saha organized and planned Crime Busters for Bulloch County's Middle School students and it was centered around the wonders of chemitry. Students were able to utilize their analytical skills while being exposed to introductory chemistry topic.

Personally, Dr. Saha was more to me then just a research professor. She was the reason why I fell in love with chemistry. Before we met, I saw chemitry as a means to my degree. I never really appriciated it, and quite frankly the level of difficulty made we want to shy away from the subject as a whole. Dr. Saha showed me how chemitry connects to the real world around us, and helped me see how my contribution in working in chemistry can be applied to a greater good. By the time I graduated, I felt confident, competent, and a qualified chemist, and that never would have happened without Dr. Saha.

Overall, Dr. Saha was a crucial part to my success and she deserves any award or honor because of her dedication to Chemistry, her students, Georgia Southern University and the science community. She previously was awarded the GSU Academic Excellence Award, and you would be lucky to have her represent your organization as the recepient for the USG Felton Jenkins, Jr. Hall of Fame Faculty Award.

Sincerely,

Brooke N Harris

Brooke Harris
Student of the University of Florida's College of Pharmacy

To Whom It May Concern,

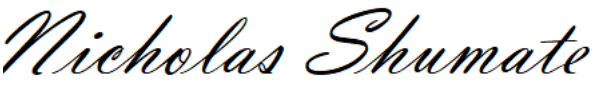
It has been over two years since I had the privilege of meeting Dr. Arpita Saha. I have known her as my professor, close mentor, and friend for quite some time, and she is the only professor I had in Georgia Southern that I am still in contact with. I met Dr. Saha first as my professor for Advanced Inorganic Chemistry in Spring 2018. Dr. Saha demonstrated throughout her class that not only does she possess a strong passion for inorganic chemistry, but that she also had a passion for her students to learn. I remember vividly after our third test of the semester, Dr. Saha spent the entire session the next day ensuring that her students understood each principle covered, instead of merely sending back a piece of paper with a grade on it. Her diligence and receptiveness to her students' needs allowed her students to grow, learn, and she made sure that no student was left behind.

Dr. Saha was also active in the lab portion of class and took her time to guarantee that each student was understanding the chemical reactions taking place, rather than simply following instructions on a sheet of paper. Her enthusiasm combined with her active role in the lab allowed students to absorb the content. Her teaching in this course helped nurture my own passion for inorganic chemistry. Rare is it to meet a college professor so approachable and personable that I asked her to accept me as one of her research students to which she graciously accepted. Little did I know, the research that I was lucky enough to work on for Dr. Saha would eventually be published, and I had the honor and privilege of being a co-author on the scientific publication.

When conducting research with Dr. Saha, she truly demonstrated to me what every teacher should aspire to be: caring, thorough, and enthusiastic. Dr. Saha repeatedly made sure the students had a firm grasp around what was happening in the research lab. On many occasions, she truly exemplified what it means to be a perpetual learner: forever expanding her knowledge to better mold her own students, creating a lasting bond with them that many college students unfortunately never experience with a professor. Her desire to include us while she was learning something new displayed humility for the ever-growing field of chemistry, a mutual respect for her students, and the upmost reverence for the value of education. Dr. Saha allotted me and her other students the opportunity to gain first-hand experience when learning new chemical instruments. Dr. Saha also encouraged her students to attend extracurricular events that gave back to her community. For example, STEM fest is an event that has stations with hands-on STEM learning activities for K-12 students to participate in. Dr. Saha went out of her way to volunteer with us at the event so she could instill a love of science into the up and coming generation. Dr. Saha also made sure I was more than prepared for my presentation at the 2019 American Chemical Society Conference in Orlando, Florida. This is one of many instances of Dr. Saha's astonishing tendency to go above and beyond for her students.

I believe Dr. Arpita Saha is the perfect choice for the USG Felton Jenkins, Jr. Hall of Fame Faculty Awards. Her unique combination of creativity, exemplary teaching style, and genuine care for her students make her truly one of a kind. If you have any questions, feel free to contact me at nshumate96@gmail.com or (404) 660-2472 and I would be happy to answer them.

Thank you,



Nicholas J Shumate

Overview of Students' Evaluation Course Taught 2012-2020

Term	Course Name	Mean Score for 'Overall Rating of Instructor'
Summer 2020	CHEM 1151k (Survey of Chemistry I W/lab)	**4.3**
Spring 2020	CHEM 5233G (Environmental Chemistry)	**4.8**
Spring 2020	CHEM 5233 (Environmental Chemistry)	**5.0**
Spring 2020	CHEM 1211k ((Principle of Chemistry I)	**4.5**
Fall 2019	FYE 1220 First Year Seminar-COSM	**4.6**
Fall 2019	CHEM 3300 (Advanced Inorganic Chemistry) W/lab	**4.4**
Summer 2019	CHEM 1151k (Survey of Chemistry I W/lab)	**4.5**
Spring 2019	CHEM 1212k (Principle of Chemistry II) W/lab	**4.4**
Summer 2018	CHEM 1151k (Survey of Chemistry I W/lab)	**4.1**
Spring 2018	CHEM 3140 (Advanced Inorganic Chemistry) W/lab	**4.5**
Spring 2018	CHEM 5233G (Environmental Chemistry)	**4.8**
Spring 2018	CHEM 5233 (Environmental Chemistry)	**4.5**
Fall 2018	CHEM 1211k ((Principle of Chemistry I) W/lab	**3.8**
Fall 2018	CHEM 3300 (Advanced Inorganic Chemistry) W/lab	**3.9**
Spring 2017	CHEM 3140 (Advanced Inorganic Chemistry) W/lab	**4.4**
Spring 2017	CHEM 5233G (Environmental Chemistry)	**4.2**
Spring 2017	CHEM 5233 (Environmental Chemistry)	**3.2**
Fall 2017	CHEM 1146 (Principles of Chemistry II) W/lab	**4.2**
Fall 2017	CHEM 1146 (Principles of Chemistry II) W/lab	**4.8**
Spring 2016	CHEM 1145 (Principles of Chemistry I) W/lab	**4.4**
Spring 2016	CHEM 3140 A Lab (Advanced Inorganic Chemistry)	**4.3**
Fall 2016	CHEM 1145 (Principles of Chemistry I) W/lab	**4.3**
Fall 2016	CHEM 1145 (Principles of Chemistry I) W/lab	**4.0**
Summer 2015	CHEM 1146 A (Principles of Chemistry II)	**4.8**
Spring 2015	CHEM 1145 (Principles of Chemistry I) W/lab	**4.2**
Spring 2015	CHEM 1145 (Principles of Chemistry I) W/lab	**3.9**
Fall 2015	CHEM 1146 E (Principles of Chemistry II) W/lab	**4.3**
Fall 2015	CHEM 3140 (Advanced Inorganic Chemistry) W/lab	**4.5**
Spring 2014	CHEM 3140 (Advanced Inorganic Chemistry) W/lab	**3.7**
Fall 2014	CHEM 3140 (Advanced Inorganic Chemistry) W/lab	**2.9**
Fall 2014	CHEM 1145 (Principles of Chemistry I) W/lab	**3.4**
Summer 2013	CHEM 1146 C (Principles of Chemistry II)	**4.1**
Spring 2013	CHEM 1146 (Principles of Chemistry II) W/lab	**3.7**
Spring 2013	CHEM 1146 (Principles of Chemistry II) W/lab	**3.8**
Spring 2013	CHEM 1151 B (Survey of Chemistry I) W/lab	**4.0**

Fall 2012	CHEM 1145 (Principles of Chemistry I) W/lab	**4.5**
Fall 2012	CHEM 1145 (Principles of Chemistry I) W/lab	**3.7**
Fall 2012	CHEM 1145 (Principles of Chemistry I) W/lab	**4.4**

Evidence for student success in iFREE: A pilot of the iFREE program (Fig 1: IFREE Logo) began in Fall 2019 with a newly designed "Who wants to be a scientist" First-Year Experience (FYE) seminar course and was followed by a semester long research experience in a desired discipline in Spring 2020. Due to pandemic shut-down (mid-March), the remainder of the in person research experience portion of the program was switched to an online format, resulting in adjusting the targeted PD activities on abstract writing and data analysis (Fig. 2 shows outline for iFREE study). The pilot study was relaunched in the Fall of 2020 and is supported USG STEM IV and GS COSM office. The results of the pilot indicated students gained in research experience and were likely to continue within their chosen STEM major. In fact, students reported high levels of confidence in their ability to perform well in future courses, to work independently, and to work collaboratively with others. The assessment is still in progress. We were able to retain 84.6% (11 out of 13 students) of our first batch of iFREE cohort in Fall 2020.

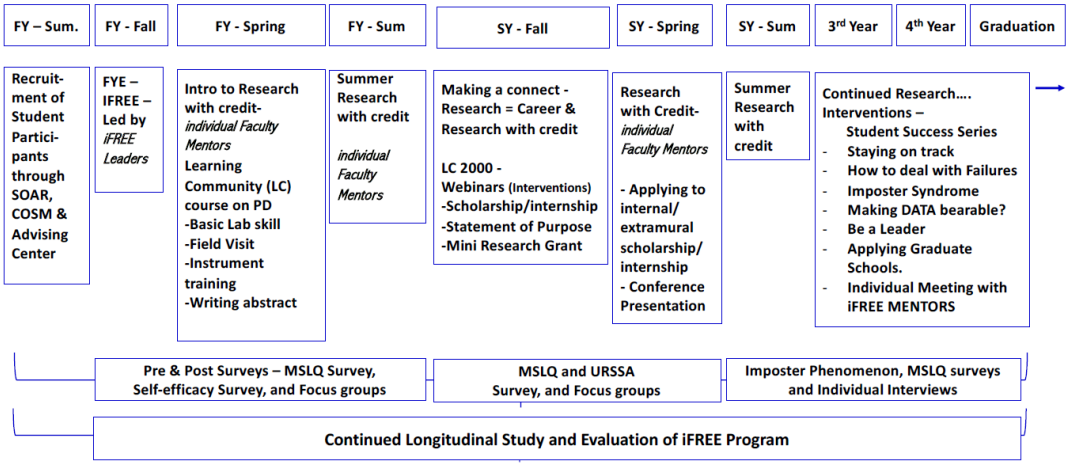


Fig. 2. Outline for iFREE program (A.Saha & coworkers unpublished data from SoTL Commons Conference 2020)

Evidence of student success in CURE: An outline of the 13 weeks, one semester laboratory course sequence is shown in Fig. 3A. We measured potential impacts related to students' understanding of the nature of scientific research, student motivation to pursue STEM, and student project ownership after completing this course. The survey was administered online, via Qualtrics to students during pre-lab lecture with help of a collaborator. The survey includes general questions about the participant's academic position and research experience as well as Likert-type items to determine students' perceptions about the CURE and their role in the course and research. 90 % students enrolled to the course responded to the survey among which 40% had never conducted

research during the school year and 60% had never done research over the summer. Ans also, 75% planned to attend some form of graduate school (primarily STEM or health related) after graduation. So, CURE course is surely providing opportunities to engage a large number of UG students to authentic research practices. The preliminary study shows (Fig. 3B) that students reported gains in working on a project where no one knows the outcome (relates to discovery) and in working in small groups (relates to collaboration). This is also important to mention that students reported gains tolerance for obstacles and understanding the research process. The manuscript is in progress and the project currently is being supported by **GS-SoTL Fellowship** Program.

Date	Event
Week 1	Course logistics & semester plan, safety training, assessment
Week 2	Compound plans due; NMR Tutorial
Weeks 3 - 4	Synthesis of novel compounds
Weeks 5 - 6	Novel compound characterization Training on instruments: Elemental analyzer, IR, UV-Vis spectroscopy, Thermogravimetric Analysis
Week 7	Application of novel compounds
Week 8	Report 1 is due. Present data and analysis
Week 9	Iteration - Repeat synthesis of novel compounds
Weeks 10 - 11	Iteration - Characterization of products
Week 12	Oral presentations of data and analysis
Week 13	Final Reports due

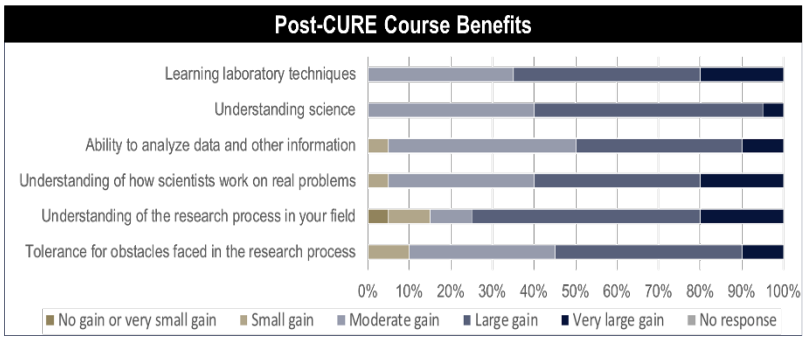


Fig. 3. A) Outline of for CURE; B) Preliminary data for benefit of CURE (A.Saha & coworkers, unpublished data SoTL Commons Conference 2020)

Evidence of Student Success in USG-ALG-OER: A survey was conducted in collaboration to assess students' response/usage to the newly created resources and gains in specific areas of learning. Response rate for post implantation survey was 16% (mostly freshmen and sophomores, 30 out of 190 enrolled). Of the 30 students that responded, 100% indicated that they had access to the libguides materials created through the ALG grant. This was expected since the materials were free, linked to the LMS, and hosted on the university's library website. Over 66% of students felt that the textbook was somewhat or very much critical to getting a satisfactory grade in the class, doing well on homework, and understanding lecture material. A smaller majority (~ 54%) felt that it was critical to doing well on exams too. Regarding textbook restructuring, over 50% of respondents agreed or strongly agreed that the figures, tables, and sample problems were easy to understand, well placed, and helped them understand the text. 50% of students agreed or strongly agreed that the examples were relevant to their major. This reflects the goal to include engineering examples in the libguides materials. Fig. 4A and B indicates the distribution of student responses on various features of textbook design.

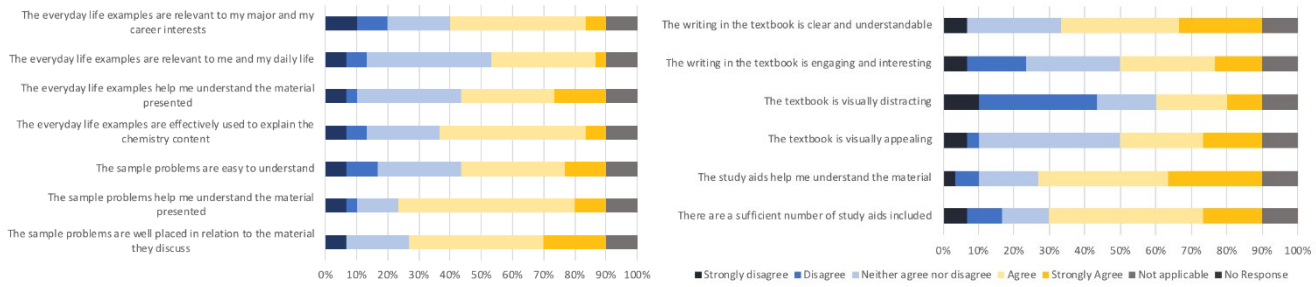


Fig. 4A and 4B (A.Saha & coworkers, unpublished data SoTL Commons Conference 2020)

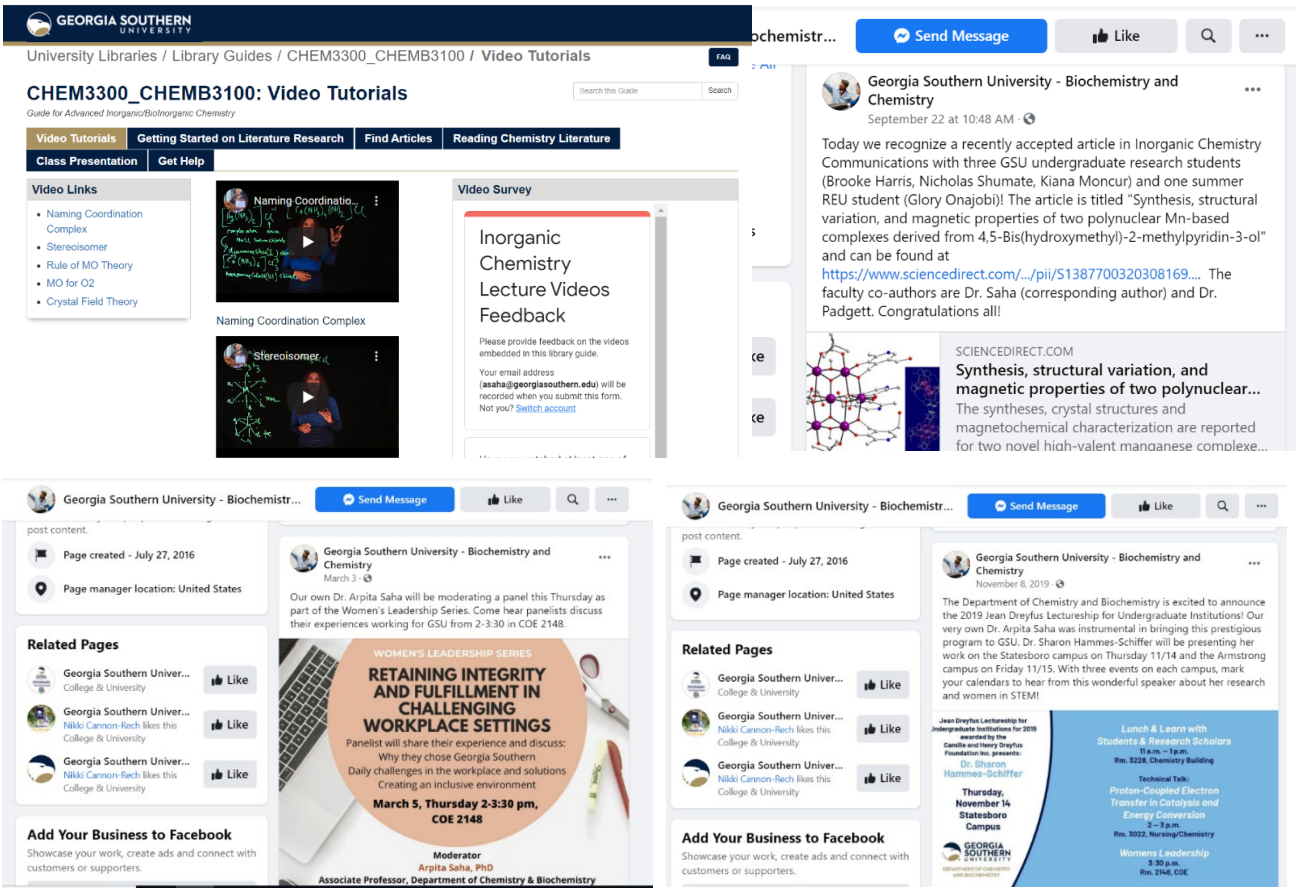


Fig. 5. (left to right) A) Lightborad videos hosted in GS Libguides Fig. 5 B, C, D) Official GS Dept. of Chemistry/Biochemistry Social media coverage for publishing peer-reviewed journal with UG students, arranging leadership workshops and Dreyfus lecture series

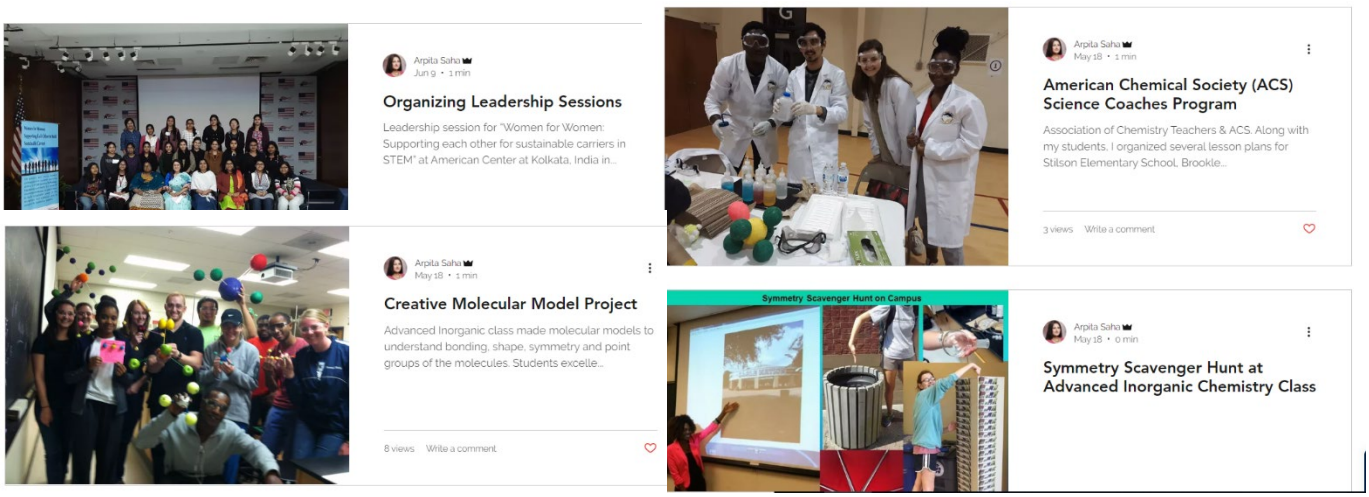


Fig. 6. (left to right) A) Leading a PD activity on 'Women for Women: Supporting each other for sustainable carriers in STEM in 2019' at American Center, India (supported by U.S. Consulate in Kolkata, India) invited by Change Initiative, non-profit organization Fig. 6 B, C, D) Snapshots of various students activities, outreach and class projects taken from SahaHomepage