

Nicholas R. Sasing

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RESEARCH INTERESTS

My primary interests are in the advancement of photovoltaic cells, batteries, and capacitors.

EDUCATION

University of Georgia

Graduate degree in Chemistry

Athens, GA
Aug 2020 - Present

University of Wisconsin-Madison

Bachelor of Science in Chemistry

Bachelor of Science in Economics

Madison, WI
Dec 2012
Dec 2012

RESEARCH EXPERIENCE

Inorganic and materials projects, with the guidance of Dr. Tina Salguero **Dec 2020 - Present**

Mo₃ synthesis **Jan 2021 - Present**

- Synthesis via two separate methods (CVT and reductive metathesis)
- Analysis via PXRD, ASPXRD, SCXRD, SEM/EDS, and temperature-dependent Raman
- Additional testing provided by National Institute of Standards and Technology, UC-Riverside, and Georgia Electron Microscopy

NbS₃ synthesis (various polymorphs) **Jun 2021 - Present**

- Synthesis via CVT
- Analysis via PXRD, SCXRD, SEM/EDS, and Raman
- Additional testing provided by UC-Riverside and Georgia Electron Microscopy

MoS₃ synthesis **Jun 2021 - Present**

- Synthesis ongoing
- Analysis via PXRD, SEM/EDS, and Raman

1T-TaS₂ synthesis **Aug 2021 - Present**

- Synthesis via CVT and solid state
- Analysis via PXRD, SEM/EDS, and Raman
- Additional testing provided by UC-Riverside and Georgia Electron Microscopy

(TaSe₄)₂I synthesis **Dec 2021 - Present**

- Synthesis via CVT
- Analysis via PXRD, SEM/EDS
- Additional testing provided by UC-Riverside

Nb₃I₈ synthesis **Feb 2022 - Present**

- Synthesis via CVT
- Analysis via PXRD, SEM/EDS

NbS₄ synthesis **Jun 2022 - Present**

- Synthesis via CVT
- Analysis via PXRD, SEM/EDS

LiCoPO ₄ synthesis	Aug 2022 – Present
<ul style="list-style-type: none"> • Synthesis via hydrothermal reactions • Analysis via PXRD, SEM/EDS 	
Cu ₃ NbS ₄ synthesis	Dec 2022 - Present
<ul style="list-style-type: none"> • Synthesis via CVT • Analysis via PXRD, SEM/EDS 	
NbAs synthesis	Dec 2022 - Present
<ul style="list-style-type: none"> • Synthesis via CVT • Analysis via PXRD, SEM/EDS 	
TaS ₃ synthesis	Dec 2022 - Present
<ul style="list-style-type: none"> • Synthesis via CVT • Analysis ongoing 	
MoBr ₃ synthesis	Dec 2022 - Present
<ul style="list-style-type: none"> • Synthesis via CVT • Analysis ongoing 	

Industrial Hygienist with Naval Hospital Camp Pendleton	
Diesel exhaust particulate exposure of Marines operating AAVs	Aug - Nov 2019
<ul style="list-style-type: none"> • Sampling and analysis of potential over-exposure to Assault Amphibious Vehicle personnel 	
Weapons fire impulse noise measurements	Jun - Nov 2019
<ul style="list-style-type: none"> • Sampling and analysis of impulse noise from various weapons systems via advanced meters 	

UW-Madison, with the guidance of Dr. Pamela Doolittle	
Gold nanoparticle generation	Jun 2012 - Dec 2012
<ul style="list-style-type: none"> • Generation of nanoparticles via environmentally considerate means 	
Silver solubility as a function of chloride concentration	Jan 2012 - May 2012
<ul style="list-style-type: none"> • Monitored free ion concentration for metals as dependent upon of the concentration of other ions 	
Phosphorous and nitrogen content related to algae blooms	Jul 2011 - Dec 2011
<ul style="list-style-type: none"> • Studying the direct effects of two ions on fresh-water algae growth • Became foundation for culminating undergraduate analytical laboratory experiment 	

TEACHING EXPERIENCE

Grader, University of Georgia Dept. of Chemistry	Sep 2021 - Present
<ul style="list-style-type: none"> • Grade exams and homework assignments for nearly 1,000 undergraduate students per semester 	
Prevention of and Response to Suicide Bombing Incidents	Aug 2017 - May 2018
<ul style="list-style-type: none"> • Taught three sessions to (45) Marines of local security force as a certified DHS trainer 	
UW-Madison Faculty Assistant, Analytical Chemistry (H) 329	Jun 2013 - Jul 2013
UW-Madison Faculty Assistant, Analytical Chemistry (H) 329	Jan 2013 - May 2013
<ul style="list-style-type: none"> • Instructed discussion and laboratory sections, held tutoring sessions, and graded exams and coursework. 20-25 students in each section. Professor was Dr. Linda Zelewski, Lab Director was Dr. Pamela Doolittle. 	

PUBLICATIONS

-Kargar, F., Barani, Z., **Sesing, N.R.**, Mai, T.T., Debnath, T., Liu, Y., Zhu, Y., Biacchi, A.J., da Jornada, F.H., Bartels, L., Hight Walker, A.R., Davydov, A., Salguero, T.T., Lake, R.K., Balandin, A.A. Elemental Excitations in MoI₃ One-Dimensional van der Waals Nanowires. *Applied Physics Letters*. 28 Nov 2022.

- Ghosh, S., Kargar, F., **Sesing, N.R.**, Barani, Z., Salguero, T.T., Yan, D., Rumyantsev, S., Balandin, A.A. Low-Frequency Current Fluctuations in Quasi-1D (TaSe₄)₂I Weyl Semimetal Nanoribbons. *Advanced Electronic Materials*. 20 Nov 2022.
- Taheri, M., Brown, J., Rehman, A., **Sesing, N.R.**, Kargar, F., Salguero, T.T., Rumyantsev, S., Balandin, A.A. Electrical Gating of the Charge-Density-Wave Phases in Two-Dimensional h-BN/1T-TaS₂ Devices. *ACS Nano*. 31 Oct 2022.
- Sesing, N.R.** Botero y su Descripción de la Violencia en Colombia. *¡Albricias!*, 28-29. Fall 2008.
- Barani, Z., Geremew, T., Stokey, M., **Sesing, N.R.**, Kargar, F., Schubert, M., Salguero, T.T., Balandin, A.A. Quantum Composites – Disordered Materials with Strongly-Correlated Phenomena. *Nature*. In Review.

PRESENTATIONS

- Air Quality Awareness, Camp Pendleton Environmental Security **2020**
- Developed slide deck involving the numerous aspects of air quality considerations and laws, presented to three groups aboard Camp Pendleton
- Lead Awareness and Ergonomics Awareness, Naval Hospital Camp Pendleton **Oct 2019**
- Developed two slide decks for the Safety Officers of 1st Marine Division and 1st Marine Logistics Group, potentially standardizing mandatory annual training for up to 45,000 personnel
- Local exhaust ventilation system operations, Naval Hospital Camp Pendleton **Sep 2019**
- Standardized measurements and understanding of vehicle exhaust and its capture with 20 Industrial Hygienists from five offices
- Noise measurement and control, Naval Hospital Camp Pendleton **Apr 2018**
- Instructed 25 hearing-conservation-related medical professionals
- Military-specific presentations **Nov 2014 – Present**
- Numerous classes concerning fire/LASER/motorcycle/HAZMAT/weapons safety, rear/forward/main COC construct, close air support, combat reports, communications equipment, detainee handling, immediate action drills/SOPs, and convoy operations/orders
- Undergraduate Poster Symposium, UW-Madison **May 2012**
- Presented research on silver solubility as a function of free ions

PROFESSIONAL HISTORY

- Student Laboratory Assistant, Center for Applied Isotope Studies, Athens, GA **Aug 2021 - Present**
- Operate three dual inlet mass spectrometers simultaneously, testing isotopic ratios for both carbon and hydrogen samples
 - Operate high temperature conversion elemental analyzer isotope ratio mass spectrometer for hydrogen isotope ratio measurement
- Physical Scientist, Environmental Security Department, Camp Pendleton **Nov 2019 - Jul 2020**
- Plan, coordinate, develop, and maintain oversight of MCB Camp Pendleton's air quality programs
 - Coordinate air quality studies and programs for a base with a population of over 70,000, monitor emissions and their sources, complete air quality reporting, and acquire/manage 250+ permits
 - Provide regulatory liaison and facilitate inspections and audits to ensure mandated compliance
- Industrial Hygienist, Naval Hospital Camp Pendleton **Nov 2018 - Nov 2019**
- Anticipate, recognize, evaluate, and control workplace environmental factors which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers.
 - Complete periodic industrial hygiene (PIH) surveys of 10 units aboard Camp Pendleton. This included surveying 104 shops and 441 processes for these units, ensuring the well-being of their

4,320 active-duty service members, 363 reserve service members, 14 civilian employees, and 41 contractors.

- Measure and analyze welding fume, respirable silica, and diesel exhaust exposure. Measure local exhaust ventilation, light, and noise levels, and evaluate respiratory protection, hearing conservation, personal protective equipment, blood-borne pathogens, occupational reproductive hazard, sight conservation, lead, hazardous material/waste, engineering controls, and ergonomics programs.

Logistics Officer, United States Marine Corps (see federal resume) **Nov 2013 - Present**

- Logistics Officer (Reserve), 4th Air Naval Gunfire Liaison Company, Force Headquarters Group
- Logistics Officer (Reserve), 4th Light Armored Reconnaissance Battalion, 4th Marine Division
 - Provided for 406 Marines and Sailors for one month in NATO exercise in Norway
- Maintenance Management Officer, Company Executive Officer, Headquarters Battalion, 1st Marine Division
 - Managed the equipment readiness of gear set valued at over \$130 million and the support and training of 700 personnel
- Assistant Logistics Officer, 1st Battalion, 1st Marines, 1st Marine Division
 - Oversaw the provision of all facets of logistics for a 1,200 person force engaged in exercises across Australia for a period of 7 months
- Motor Transport Platoon Commander, Headquarters Battalion, 1st Marine Division
 - Provided leadership for 60 personnel in support of pre-deployment training and tactical motor-transport

Analytical Stockroom Assistant, UW-Madison **Aug 2013 - Oct 2013**

- Prepare solutions and laboratory equipment for eight laboratory sections

COMMUNITY SERVICE

UGA Academic Honesty, Athens, GA **Aug 2020 - Present**
Academic Honesty Panelist

- Review materials related to an academic honesty allegation, hear from the instructor and student, and decide whether a violation of the policy has occurred

UGA Student Veterans Association **Sep 2020 - Present**
Chapter Vice President

- Plan and support veteran-related events, including veteran recognition and collaboration with charitable partners
- Serve on the Dean-of-Students-led board for the replacement of the Student Veterans Resource Center Director

Chemistry Graduate Student Organization **Sep 2020 - Present**
Chapter Community Service Chair

- Orient 20+ first year graduate students and prospective graduate students to the department
- Organize and participate in several community service projects

Blue Key National Honor Society **Mar 2021 - Present**
Voting Member

- Serve on new member selection committee

Navy and Marine Corps Relief Society, Camp Pendleton, CA **Apr 2019 - Jan 2021**
Thrift Store and Public Outreach Volunteer

- Sort, test, and prepare merchandise for sale at a non-profit thrift store
- Educate active duty Marines and Sailors about the benefits available through the society
- 430+ hours volunteered

Seasons Hospice and Palliative Care, Vista, CA
Hospice Volunteer

Sep 2018 - Feb 2020

- Provide comfort to patients and their family during hospice care
- 40 hours volunteered

Saint Vincent de Paul Food Pantry, Madison, WI
Food Pantry Volunteer

Jan 2013 - Oct 2013

- Stock food and basic life items, assist clients in selection of items
- 85 hours volunteered

HONORS, GRANTS, AND AWARDS

Horton-Devore Leadership Award	Oct 2022
UGA Summer Research Grant Recipient	Apr 2022
Lockheed Martin STEM Award Recipient	Dec 2020, Apr/Dec 2021, Apr 2022
Navy and Marine Corps Commendation Medal	Oct 2021
Selection for UGA Chapter of the Blue Key National Honor Society	Mar 2021
Military Outstanding Volunteer Service Medal	Apr 2020
Meritorious Service Medal	May 2018
2017 Marine Corps Individual Safety Award	Feb 2018
Recognition of Outstanding Student Employee Award, UW-Madison Housing	May 2014

TECHNICAL SKILLS

Powder XRD, Single Crystal XRD, SEM/EDS, Dual Inlet Mass Spectroscopy, Raman spectroscopy, OSHA 10-hour, Hazardous Materials Prep & Response, chemical safety training for faculty, HAZMAT-handler certified, LabView, Matlab, Microsoft Programs, HPLC, ICP-OES, UV-Vis spectrophotometry, sampling for noise, mold, light, and various fumes/gasses/and respirable particles

LANGUAGES

Native English, intermediate Spanish, basic German