Sarah Schyck

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I am a motivated PhD with a strong background in utilizing wet chemistry techniques for the synthesis of colloidal materials. Throughout my academic journey, I have successfully designed and executed experiments, leveraging a diverse range of techniques including X-ray diffraction and scattering, electron microscopy, and more. My dedication to scientific exploration is matched by my communication and teamwork skills, as I thrive on collaborating with fellow researchers to tackle complex scientific problems.

Education

2019 – Current
PhD Candidate in Chemical Engineering, TU Delft, Netherlands
Thesis title: *Anisotropic and Magnetic Microparticles: Preparation and Out-of-Equilibrium Assembly*

2016 – 2018
M.Sc. in Physics, University of Nevada, Las Vegas, U.S.
Thesis title: *Studies of Inner-shell Chemistry of Mercury Based Compounds under Extreme Conditions.* DOI: 10.34917/14279172

2012 – 2015
B.S. in Physics, University of Georgia, U.S.
Projects: *Effect of Organic Hole Scavengers on the Photochromism of* Bi_2WO_6 and *Growth of Cu nanofilms on polystyrene bead mono layer substrates by means of oblique angle physical vapor deposition.*

Internships

Jan – July 2016
ORAU and LSE Intern at Savannah River National Lab
Synthesis of noble metal nanoparticles and characterization of their size and surface charge. Study of nucleation mechanism of noble metal nanoparticle growth on oxide-based nanoparticles.

Synchrotron Experimental Research

Argonne National Laboratory	Advanced Photon Source, Sector 16 HPCAT. Beamlines: ID-D, ID-B, BM-D, and BM-B.
University of Saskatchewan	Canadian Light Source. Beamlines: Far-IR (02B1-1) and Mid-IR (01B1-1).
Lawrence Berkeley National Laboratory	Advanced Light Source. Beamline: BL 12.2.2.
European Synchrotron Radiation Facility	Beamlines: BM26 (DUBBLE) and ID13 (nano- and micro-branch.

Teaching Experience

2019 – 2022
Graduate Teaching Assistant at TU Delft, Delft, Netherlands
Assisted in Molecular Transport Phenomena and Advanced Inter facial Engineering for the MSc course. Supervision of B.Sc. and M.Sc. thesis projects.

2017 – 2018
Graduate Teaching Assistant at University of Nevada, Las Vegas, U.S.
Two introductory physics laboratory sections per semester: non-calculus based physics I and calculus based electromagnetism.

Skills

- Synthesis and assembly of colloidal and nano-materials.
- Lithography: (i) experience in a Class 100 clean room, (ii) photoresist epoxy coating of substrate, and (iii) soft baking and UV exposure.
- Diamond anvil cell (DAC), multi-anvil large volume press, Paris Edinburgh Cells (PEC), and handling of Beryllium gaskets.
- Characterization of materials by means of Raman, Far-IR, Mid-IR, FTIR, UV-Vis spectroscopy, XRD, XAS, XANES, XRS, SAXS, SEM, TEM, Optical Microscopy, DLS, and EDXRD. Synthesis of nanomaterials: (i) oblique angle co-deposition, (ii) electron beam deposition, and (iii) vacuum dual-source magnetron sputtering deposition.
- Data visualization and analysis with various software and packages: Python, PyFAI, Dioptas, Microsoft suite, MatLab

Research Publications

Journal Articles

1. **Sarah Schyck**, Meijer, J.-M., Baldauf, L., Schall, P., Petukhov, A. V. & Rossi, L. (2022). Self-assembly of colloidal superballs under spherical confinement of a drying droplet. *JCIS Open*, *5*, 100037. doi:https://doi.org/10.1016/j.jciso.2021.100037
2. **Schyck, Sarah**, Evlyukhin, E., Kim, E. & Pravica, M. (2019). High pressure behavior of mercury difluoride (HgF2). *Chemical Physics Letters*. doi:10.1016/j.cplett.2019.03.045
3. Evlyukhin, E., Kim, E., Cifligu, P., Goldberger, D., **Schyck, Sarah**, Harris, B., … Pravica, M. (2018). Synthesis of a novel strontium-based wide-bandgap semiconductor via x-ray photochemistry under extreme conditions. *J. Mater. Chem. C*, *6*, 12473–12478. doi:10.1039/C8TC04496A
4. Evlyukhin, E., Kim, E., Goldberger, D., Cifligu, P., **Schyck, Sarah**, Weck, P. F. & Pravica, M. (2018). High-pressure-assisted x-ray-induced damage as a new route for chemical and structural synthesis. *Phys. Chem. Chem. Phys. 20*, 18949–18956. doi:10.1039/C8CP02119H

Books and Chapters

1. Murph, S. E. H., **Schyck, Sarah** & Lawrence, K. (2022). Engineered nano-antenna susceptor as efficient platforms for efficient uptake and release of analytes. In T. S. Srivatsan, P. K. Rohatgi & S. Hunyadi Murph (Eds.), *Metal-matrix composites* (pp. 351–365). Cham: Springer International Publishing.

Selected Conferences

2023 **APS March Meeting** Talk presented:
S. Schyck, S.C. Cure, S. Sacanna, L. Rossi. "*Enhanced Swimming Behavior of Active Hematite Microparticles*," (4-11 March 2023, Las Vegas, USA)

2022 **APS March Meeting** Talk presented:
S. Schyck, J.M. Meijer, M. Schelling, A. Petoukhov, L. Rossi. "*Self-assembly of Colloidal Hematite in Evaporating Droplets*," (14-18 March 2022, Chicago, USA)

2021 **CHAINS** Talk presented:
S. Schyck, J.M. Meijer, L. Baldauf, P. Schall, A. Petoukov, L. Rossi "*Crystallization of Colloidal Superballs in Evaporating Droplets,*" (7-8 December 2021, Virtual)