Andrew **Salij**

Computational Chemist

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Education

Present	**PhD in Chemistry**, Northwestern University, expected graduation September 2024
2019	**BA in Chemistry**, St. Olaf College, *magna cum laude*

Skills

Programming Languages	**Python**, MATLAB, Bash, Wolfram Mathematica, LabVIEW.
Fields	Chemistry, Optics, Machine Learning, Materials Science.
Methods	DFT, FDTD, Computer-aided Design.
Tools	git, Linux, Q-Chem, Quantum Espresso, PySCF, Tidy3D.

Experience

Present – September 2019 — Northwestern University

Doctoral Researcher with Roel Tempelaar

- Developed Python software (numpy/scipy, pandas, TensorFlow) to model and to predict electronic structure and optics in both quantum and classical regimes
- Provided computational tools and and quantum chemical theoretical insight into many cross-functional collaborations
- Built data pipelines incorporating *ab initio* quantum chemical calculations to predict material properties

Python | TensorFlow | Bash | Quantum Optics | RCWA | FDTD

May 2019 – June 2016 — St. Olaf College

Undergraduate Researcher with Robert Hanson (Sep. 2018 - May 2019)

- Contributed to development of a website applet (JS-ICE) using JavaScript and the Jmol chemical scripting language for in-browser visualization and manipulation of crystal structures

Structures Lead, St. Olaf-Carleton Engineering Team (2016-2017)

- Organized the design of the structure of an autonomous drone using computer-aided design (CAD)
- Managed a team of ∼10 people in delivering drone parts on schedule

Undergraduate Researcher with Rodrigo Sanchez-Gonzalez (Summer 2016)

- Wrote analysis software for data from the St. Olaf Pulsed Hypersonic Improved Test Cell and built additional components for the instrument using computer-aided design
- Developed novel software for signal processing in the creation of 2D temperature maps using single-shot structured illumination

JavaScript | MATLAB | LabVIEW

Awards

2023	Outstanding Researcher (Visionary), International Institute for Nanotechnology
2023	1st Place, InQuanto™ Quantum Chemistry Challenge, Quantinuum
2022	Poster Prize (2nd) at International Symposium on Chirality (2022) in Chicago
2019	Undergraduate Award in Physical Chemistry, St. Olaf College
2017	Great Conversation Fellow, St. Olaf College, given annually to two students for excellence in humanities
2016	2nd Place Prize for proposed cause of Hypoplastic Left Heart Syndrome in Innovative Minds Partnering to Advance Cardiac Theranostics (IMPACT) at Mayo Clinic

Publications

Chen, T., **Salij, A.**, Parrish, K., Rasch, J., Brown, P., Dhavamani, A., Urraci F., Pescitelli, G., Aronica, L.A., Zinna, F., Arnold, M. S., Wasielewski, M. R., Di Bari, L., Tempelaar, R., & Goldsmith, R. (2024). A Chiral Microcavity based on apparent circular dichroism. *Nature Communications*, *15*, 3072.

Salij, A. H., Goldsmith, R. H., & Tempelaar, R. (2024). Theory predicts 2D chiral polaritons based on achiral Fabry–Pérot cavities using apparent circular dichroism. *Nature Communications*, *15*, 340.

Salij, A., Goldsmith, R. H., & Tempelaar, R. (2021). Theory of Apparent Circular Dichroism Reveals the Origin of Inverted and Noninverted Chiroptical Response under Sample Flipping. *Journal of the American Chemical Society*, *143*(51), 21519-21531.

Salij, A., & Tempelaar, R. (2021). Microscopic theory of cavity-confined monolayer semiconductors : Polariton-induced valley relaxation and the prospect of enhancing and controlling valley pseudospin by chiral strong coupling. *Physical Review B*, *103*(3), 035431.