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# CURRICULUM VITAE

## ASHLEY S. DALE

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• DALEAS@IUPUI.EDU •

### EDUCATION

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- 2024 **Purdue School of Science, Indianapolis, IN**  
Ph.D. in Physics  
Research Area: *Condensed Matter Physics, Spintronics, Computational Physics*  
  
Thesis: *Novel Materials for Spintronic Devices*
- 2023 **MagLab Summer School, National High Field Magnetic Laboratory**
- 2020 **Purdue School of Engineering and Technology, Indianapolis, IN**  
Master of Science in Electrical Engineering  
  
Thesis: *3D Threat Detection Using Virtual-Environment Assisted Deep Network Training.*  
<http://hdl.handle.net/1805/24756>
- 2020 **National School on X-Ray and Neutron Scattering, Argonne National Lab and Oak Ridge National Lab**
- 2020 **Purdue School of Science, Indianapolis, IN**  
Master of Science in Physics  
  
Thesis: *Developing an Approach to Improve Beta-Phase Properties in Ferroelectric PVDF-HFP Thin Films*  
<http://hdl.handle.net/1805/22686>
- 2017 **Butler University, Indianapolis, IN**  
Bachelor of Science in Physics, Magna Cum Laude  
Minors in Mathematics, Computer Science, and Chinese  
  
Thesis: *Analysis of Optogalvanic Investigations in Noble Gasses*
- 2017 **Purdue School of Engineering and Technology, Indianapolis, IN**  
Bachelor of Science in Electrical Engineering  
University Honors College
- Advanced Courses Efficient AI, Advanced Quantum Physics Theory, Advanced Electromagnetism, Advanced Statistical Mechanics, Coherent Optics and Quantum Electronics,

Pattern Recognition and Decision-Making Processes, Algorithms, Digital Image Processing, Transmission of Information, Modeling & Design of Smart Devices, Principles of Nanotechnology, Integrated Nanosystems & MEMS/NEMS Devices, Linear Control Systems Theory, Theory of Operating Systems, Probabilistic Methods in Electrical Engineering

TEACHING EXPERIENCE

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2022 **Emerging Scholars of College Instruction Program (ESCIP)**  
 Developed and documented university teaching skills in preparation for a future faculty position.

2021, May - October **Adaptive Educational Services Aide**  
 Worked with visually impaired student to understand concepts in Optics, Electricity and Magnetism, and Thermodynamics. Assisted with interpreting textbook figures and diagrams, completing homework assignments, and implementing other adaptive services as needed.

2018 – 2019, 2023 **Recitation Instructor – Physics Department, Purdue School of Science, Indianapolis**  
 Presented physics problems and solution techniques to undergraduate students in a lecture setting with an emphasis on mathematical literacy, critical thinking skills, and scientific communication. Provided feedback on exams and homework assignments.

2018 – present **Lab Instructor – Physics Department, Purdue School of Science, Indianapolis**  
 Instructed laboratory courses in undergraduate physics. Rewrote and standardized the first semester of the undergraduate physics lab course. Mentored students in learning physics concepts, mastering laboratory skills, technical writing. Provided feedback on experiments and homework assignments.

Course	Mean Evaluation Score
2018 Fall: General Physics I (23253)	5.51/6
2020 Spring: Mechanics (20455)	5.16/6
2020 Spring: Mechanics (23336)	5.48/6
2020 Summer: General Physics I	5.74/6
2020 Fall: Mechanics (23947)	-
2021 Spring: Mechanics (24004)	-
2021 Fall: Mechanics (33608)	4.76/6
2022 Spring: Mechanics (21613)	5.64/6
2022 Spring: Mechanics (20784)	4.83/6

July 2017 **Counselor – Preparing Outstanding Women for Engineering Roles (POWER) Summer Camp**  
 Taught and closely mentored a group of six young women interested in STEM careers fundamental engineering skills such as soldering, 3D CAD modeling, etc.

- 2014 - 2017      **Teaching Assistant - Butler University Physics Department**  
Responsible for laboratory experiments set-up, assisting the professor, mentoring and tutoring students during labs and recitations, grading laboratory assignments and homework
- 2014 - 2017      **Peer Tutor - Butler University Learning Resource Center**  
Specialized in communicating mathematics courses for students with learning challenges. Courses tutored include calculus-based physics, calculus, C++ computer programming, probability, statistics, and algebra.
- 2016              **Teaching Assistant - Purdue School of Engineering and Technology**  
Responsible for holding recitation sessions for ENGR297 Computer Tools for Engineering; assisted students with homework questions and MATLAB computer programming.
- 2014 - 2016      **Peer Tutor - Butler University Engineering Dual Degree Program through a grant from the NSF**  
As a Peer Tutor Supervisor I collected and statistically analyzed data concerning the correlation of peer tutoring/mentorship and retention in STEM fields. I also responded to student requests for tutoring and acted as a coordinator between peer tutors and tutees.
- As a peer tutor, I assisted students in fundamental engineering courses with an emphasis on physics, mathematics, and computer science material. I also actively mentored and encouraged students to pursue STEM careers.

## LEADERSHIP & PROFESSIONAL ORGANIZATIONS

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- 2022              **Girls Who Code, Southport Highschool Chapter**  
*Guest Speaker* - Addressed students about my experience as a woman in STEM and my journey in becoming a coder.
- 2021              **Indiana University Center of Excellence for Women and Technology**  
*Mentor* - connected with women in STEM fields to answer their questions about university education. Aided in networking and goal-oriented decision making.
- 2020, 2021      **Indiana State Science Fair**  
*Judge* - Met with middle school and high school students to discuss and rate their projects. Provided feedback on project quality and presentation skills.
- Demonstrator* - Presented demonstrations of physics phenomena to students and answered questions about physics education.
- 2016 - 2019      **Tau Beta Pi - National Engineering Honor Society**  
*Outreach Committee Member* - responsible for increasing on-campus visibility and engaging with community through volunteer events
- 2013 - 2017      **Butler University Engineering Dual Degree Club**

*Historian (2015 – 2017)* – Responsibilities include documenting club activities and providing context for incoming executive board members

*Secretary (2014)* – Communicated club information and activities to membership; publicized events; engaged with community on social media; documented ongoing business

2013 – Present

Society of Women Engineers

*Diversity, Retention, and Recruitment (DRR) Committee Representative (2017)* – Coordinate with DRR committee regarding SWE's efforts to increase diversity in STEM fields

2015 - 2017

Engineering Student Ambassadors – Butler University Engineering Dual Degree Program

*Student Ambassador* - Work to educate and inform the community about STEM education through volunteerism at VEX Robotics events, STEM fairs, university recruitment events, etc.

2016

Engineering Projects in Community Service – Butler University

*Electronic Medical Records Application for use in Dominican Republic: Communication Lead* - Responsible for inter-team communication and coordinating with sponsoring client; implemented version control; updated application SDKs and improved user interface

## HONORS AND AWARDS

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2023	Fellow of the American Physical Society Data Science Education Community of Practice
2023	IUPUI School of Science Teaching Assistant Award – Physics Department nominee
2022	Google Ph.D. Fellowship Finalist (IU nominee)
2021	Advanced Photon Source/Illinois Institute of Technology X-Ray Absorption Fine Structure Virtual School
2021	School of Science Teaching Assistant Award, IUPUI (Nominated)
2021	Elite 50, IUPUI (Nominated)
2020	Multidisciplinary Undergraduate Research Institute Academic Year Award, IUPUI
2020, 2022	Graduate and Professional Education Grant Award, IUPUI
2019	Women's Leadership Reception, IUPUI (Nominated)
2018	Top 100 Outstanding Student, IUPUI (Nominated)

2017	Outstanding Graduating Chinese Minor
2013-2017	Dean's List, Butler University College of Liberal Arts and Sciences
2015-2017	Outstanding Academic Achievement, Butler University Engineering Dual Degree Program
2016, 2018	Top 100 Outstanding Student, Butler University (Nominated 2015, 2017)
2016	Marshall Dixon Award in Physics, Butler University
2016	Upsilon Pi Epsilon (International Honor Society for Computer Science)
2016	Tau Beta Pi, Indiana Zeta Chapter (National Engineering Honor Society)
2015 – 2017	Honors College, Indiana University – Purdue University, Indianapolis
2015	Sigma Pi Sigma (Society of Physics Students National Honor Society)
2014, 2015	Inter-Collegiate Chinese Speech Competition, IUPUI Confucius Institute
2013 – 2017	Honors Program, Butler University

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## RESEARCH EXPERIENCE

2019-present	<p><b><u>Study of Energy Changes in Voltage-Controlled Spin Crossover Molecular Thin Films</u></b>  <i>Cheng Research Group – Physics Department, IUPUI</i></p> <ul style="list-style-type: none"> <li>• Developed 3D Monte Carlo simulation approach to approximate spin crossover thin film heterostructure characteristics using 3D Ising model</li> <li>• Fabricated switchable three-terminal devices to demonstrate thin film conductance properties</li> <li>• Team lead conducting X-Ray Absorption Spectroscopy (XAS) and X-Ray Magnetic Circular Dichroism (XMCD) experiments on spin crossover thin films at Argonne National Lab Advanced Photon Source Beamline 4-ID-C</li> </ul> <p>Continued developing a viable logic device based on organic thin films by developing models for operating parameters, fabricating devices, and testing functionality using various spectroscopic and electrical methods</p>
2022-present	<p><b><u>Trusted Data Anomaly Detection (TADA) in Ground Truth Image Data</u></b>  <i>Electrical and Computer Engineering Department, Indiana University Purdue University Indianapolis with the Office of Naval Research and NSWC Crane</i></p> <ul style="list-style-type: none"> <li>• Compared three different variational auto encoder structures for their feature disentangling properties</li> </ul>

- Created image processing workflow with a Jupyter notebook framework, implementing an interactive approach to UMAP plotting and analysis
- Led a team of four machine learning researchers in data curation, annotation, processing, and analysis using Tensor Flow Object Detection API

2022

**Visual Microphone 2.0**

*Electrical and Computer Engineering Department, Indiana University Purdue University Indianapolis*

- Implement the *Visual Microphone* (Davis et. al., SigGraph 2014) using Xilinx FPGA and Jupyter notebook framework
- Improves throughput speed and aims for real-time video processing with low power and memory requirements
- Leverages improvements from smart phone video recording capabilities for sound reconstruction using interpolated frequencies

2021

**Parity-Time Symmetric Studies of Coupled Ferromagnetic Lattices**

*Dr. Yogesh Joglekar – Physics Department, IUPUI*

- Implemented the Metropolis Algorithm to study the coupled gain-loss behavior of a ferromagnetic Ising lattice under weak magnetic fields.
- Controlled the time to equilibrium in each lattice by varying the magnetic field strength, coupling strength, and coupling geometry.

2020-2022

**Naval Imagery Infrastructure Revitalization Virtual Modeling Metrics**

*Electrical and Computer Engineering Department, Indiana University Purdue University Indianapolis with the Office of Naval Research and NSWC Crane*

- Developing approaches to test validity of synthetic data for use with real-world applications by implementing statistical measures in the latent space for machine learning algorithms such as Variational Autoencoders (VAEs), Uniform Manifold Approximation and Projection (UMAP)
- Processed and curated synthetic and real-world images in a variety of formats including RGB-D and IR Data through hand-labeling and automated labeling. Designed data pipelines for various machine learning algorithms including Mask R-CNN and VAEs.
- Acting Lab Manager. Maintain and provide support for two dedicated machine learning servers, and other systems. Mentor other students in good software engineering processes and documentation

2020 – 2021

**Developing Novel Approaches to Thin Film Microscopic Image Analysis**

*Project Author and Lead Mentor – Multidisciplinary Undergraduate Research Institute, IUPUI*

- Coordinated multidisciplinary joint effort between Dr. Lauren Christopher's Electrical Engineering research group and Dr. Ruihua Cheng's Condensed Matter Physics research group.
- Used computer vision and machine learning techniques to analyze Atomic Force Microscopy images of various thin films as part of quality control work to develop a spintronics based transistor
- Funded four part-time undergraduate students and supplies for the 2020-2021 academic year. Assisted in interviewing and hiring process.
- Primary research mentor for students in the laboratory. Adapted to pandemic shut down by adjusting project goals for remote completion, allowing research to continue.
- Assisted students in learning thin film deposition methods for sample fabrication, microscopy methods, computer vision algorithms, and software engineering practices
- Resulted in conference presentations at the Indiana Academy of Sciences and IUPUI Research Day

2019

**R&D Engineering Intern***Bastian Solutions, Indianapolis, IN*

- Developed Raspberry Pi audio filter for based voice-control system implemented on warehouse trucks. Implemented basic Natural Language Processing algorithms.
- Created synthetic data with Unity software for use in machine learning training algorithms designed to assist in automated package handling
- Developed ZigBee networking firmware for custom IOT hardware applications
- Explored writing custom libraries for PIC-33 microcontrollers
- Explored data-pipeline methods for machine learning applications

2018 to 2019

**3D Virtual World for Deep Learning Training***Electrical and Computer Engineering Department, Indiana University Purdue University Indianapolis with SAIC and NSWC Crane*

- Development of over 8500 virtual world images (RGB with depth) for use in training network to detect airborne objects in conjunction with informatics team
- Trained Deep Neural Net for real-world RGB-D object detection and classification using data from a 3D virtual environment; current implementation uses Mask RCNN
- Ongoing work to establish validity criteria for virtual data in real-world applications

- 2018-2019      **Development and Characterization of Polymer Thin-Films to Increase Electrical Coercivity**  
*Cheng Research Group – Physics Department, IUPUI*
- Fabrication of PVDF-HFP Langmuir-Blodgett thin film samples on custom designed and built system
  - Characterization through ferroelectric testing, X-ray diffraction measurements, and atomic force microscopy to determine presence and proportion of beta-phase crystalline structure
  - Future Work: Fabricating and characterizing ferroelectric polymers coupled to spin-cross over complexes
- 2017      **AirK9 Companion (Drone assistant for the visually impaired)**  
*Senior Capstone Project – Electrical & Computer Engineering Department, IUPUI*
- System provides a visually impaired user with a rudimentary warning of obstacles approaching the user's trajectory
  - Engineered system architecture utilizing Internet-of-Things principles to connect a drone, microcomputer, and smart phone
  - Project Manager: maintained schedule, dependencies, resolved issues between project components and team members
- 2017      **Generalization of Dirac's Theorem for Claw-free Graphs**  
*Graph Theory Research Group, Computer Science Department, Butler University*
- Studied claw-free Hamiltonian graphs with  $k=2$  and  $k=3$
  - Assisted in theoretical mathematical proofs showing that this subset of graphs has a finite obstruction set with a limit on the order of each graph within the obstruction set, in addition to establishing new conditions for the connectivity of claw-free graphs when the obstruction set is empty or contains only one graph
- 2016 – 2018      **3D Visualization of RF Signals in Electronic Warfare to Enhance Warfighter Training**  
*Electrical and Computer Engineering Department, Indiana University Purdue University Indianapolis with the Office of Naval Research and NSWC Crane*
- In collaboration with the Office of Naval Research, assisted in the creation of a method that enables the visualization of RF signals in a 3D environment.
  - Developed and programmed theoretical experiments in MATLAB to simulate RF signals from various antennas under different conditions.
  - Created and optimized 3D CAD models of RF signals for use in visualization platforms such as SIMDIS or Autodesk Maya.



- Created and consulted on short-film animations of 3D RF patterns for educational instruction of warfighters.
- 2016 **Asymmetric Top-Down Etched Site-Controlled InGaN/GaN Quantum Dots Experimental Process**  
*Center for Photonic and Multiscale Nanomaterials at University of Michigan Ann Arbor through an NSF REU*
- Assisted in data gathering and testing asymmetric quantum dot samples for polarized single photon emittance
  - Analyzed current experimental process and designed three new pieces of laboratory equipment to enhance and simplify data acquisition
- 2015 – 2016 **Interfacing Nanoparticles to CMOS Quad Instrumentation Amplifiers for Gas-Sensing Devices**  
*Integrated Nanosystems Development Institute at Indiana University-Purdue University Indianapolis*
- Enhanced graphene wafer's reactivity to Resistive/FET testing by using physical vapor deposition to create gold nanoparticles on surface
  - Contributed conductive epoxy, providing missing conductivity between wafer terminals and preventing project redesign
- 2015 – 2017 **Analysis of Optogalvanic Effect in Noble Gasses**  
*Optical Physics Laboratory at Butler University*
- Set up Optical Physics Laboratory by repairing Nd-YAG Laser and building a Pumped Dye-Laser, preparing for future experimentation and data collection
  - Tested theoretical model against collected data, comparing the Argon and Neon atomic transitions
  - Elected to author final research report that aggregates and organizes eight years of unstructured data; forms the basis for Undergraduate Thesis in Physics

## CONFERENCES & PRESENTATIONS

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**Dale, A.S.**, Yazdani, S., Ekanayaka, E., Mishra, E., Hu, Y., Dowben, P., Freeland, J., Zhang, J., Petrache, H., Cheng, R., Determination of magnetic anisotropy due to spin-orbit coupling in spin crossover thin film. (2023, March). *American Physical Society March Meeting*. <https://meetings.aps.org/Meeting/MAR23/Session/Q57.11>

**Dale, A.S.**, Boler, W., Christopher, L., Trusted Data Anomaly Detection (TADA) in Ground Truth Image Data, Comparing VAEs (2022, October). *2022 Trusted AI Meeting, IU Bloomington*.

**Dale, A.S.**, Hao, G., N'Diaye, A., Chopdekar, R., Dowben, P.A., Cheng, R., 3D Ising model studies of mixed-state domain formation in spin crossover molecular systems (2022, March). *American Physical Society March Meeting*. <https://meetings.aps.org/Meeting/MAR22/Session/Z70.12>

- Malhotra, S., **Dale, A. S.**, Cheng, R., Ising model simulation of the effect of nearest neighbors on critical transition temperatures in spin crossover molecular system (2022, March). *American Physical Society March Meeting*. <https://meetings.aps.org/Meeting/MAR22/Session/Goo.55>
- Dale, A.S.**, Mosey, A., Dowben, P.A., Petrache, H., Cheng, R., (2021, April). Determination of High-Spin to Low-Spin Phase Transition of Organic Spintronic Device by Monte Carlo Simulation of 3D Ising-like Model. *April 2021 Meeting of the American Physical Society*. <https://meetings.aps.org/Meeting/APR21/Session/Qo8.8>
- Gerve, S., **Dale, A.S.**, Christopher, L., Cheng, R., (2021, March). Atomic Force Microscopy Image Analysis using MATLAB Application. *2021 Indiana Academy of Sciences Annual Meeting*.
- Dale, A.S.**, Christopher, L., William, A., Krogg, W., (2020, February). 3D Threat Detection using Virtual-Environment Assisted Deep Network Training. *2020 Naval Applications of Machine Learning Workshop*. [https://drive.google.com/drive/folders/19BXM3Ql294jODmEiv64P\\_bNA25uvPWdT](https://drive.google.com/drive/folders/19BXM3Ql294jODmEiv64P_bNA25uvPWdT)
- Mosey, A., **Dale, A. S.**, Phillips, J., Yazdani, S., Soruco, J., Hao, G., Manna, U., N'Diaye A., Dowben, P. A., Cheng, R., (2019 October). Voltage Controlled Spin State Switching of an Organic Spin Crossover Thin Film. *American Vacuum Society 66<sup>th</sup> International Symposium and Exhibition*. [https://www2.avso.org/symposium2019/Papers/Paper\\_MI-ThP6.html](https://www2.avso.org/symposium2019/Papers/Paper_MI-ThP6.html)
- Dale, A.S.**, Mosey, A., Soruco, J., Cheng, R., (2019, October). Developing an Approach to Improve the Beta-phase in Ferroelectric PVDF-HFP Thin Films. *American Vacuum Society 66<sup>th</sup> International Symposium and Exhibition*. [https://www2.avso.org/symposium2019/Papers/Paper\\_TF-ThP28.html](https://www2.avso.org/symposium2019/Papers/Paper_TF-ThP28.html)
- Demmings, M., **Dale, A.S.**, (2019, April). Determining Methods for Inducing Crystalline  $\beta$ -phase PVDF and PVDF-HFP copolymers in Thin Films without Post-Annealing. *2019 ACS National Meeting*. <https://www.morressier.com/article/determining-methods-inducing-crystalline-phase-pvdf-pvdfhfp-copolymers-thin-films-without-postannealing/5fc643a22d78d1fec46684bc?>
- Dale, A.S.**, Soruco, J., Mosey, A., Cheng, R., (2019, March). Optimization of ferroelectric beta-phase in PVDF thin films. *2019 Indiana Academy of Sciences Annual Meeting*
- Christopher, L., William, A., Rao, A.S., **Dale, A.S.**, Joshi, M., Chase, A., Abernathy, B., Krogg, W., (2018, October). Engineering and Informatics Student Multidisciplinary Learning Using 3D Visualization and 3D Display of Radio Frequency (RF) Concepts. *2018 ASEE Frontiers in Education Conference*. <https://doi.org/10.1109/FIE.2018.8658787>
- Dale, A.S.**, Dale, S., Cheng, Z., (2018, April). A Generalization of Dirac's Theorem for Claw-free Graphs. *Butler University Undergraduate Research Conference*. <https://digitalcommons.butler.edu/urc/2018/mathematics/1/>
- Dale, A.S.** (2017, July) Custom Sample Mount for Quantum Dots in Cryostat. *Research presented at the University of Michigan Ann Arbor Center for Photonics and Multiscale Nanomaterials*
- Kennedy, T., Hochstetler, J., Wray, R., Suttles, S., **Dale, A.S.**, Hashimoto, A., Pajkos, M., Kostelnik, M., (2017, April) Observing the Orbitals of Jupiter's Moons. *Butler University Undergraduate Research Conference*. [https://www.butler.edu/sites/default/files/2017\\_final\\_program\\_flattened.pdf](https://www.butler.edu/sites/default/files/2017_final_program_flattened.pdf)

**Dale, A.S.** (2017, April) Investing Atomic Transitions in Noble gases by Laser Optogalvanic Spectroscopy. *Butler University Undergraduate Research Conference*.  
[https://www.butler.edu/sites/default/files/2017\\_final\\_program\\_flattened.pdf](https://www.butler.edu/sites/default/files/2017_final_program_flattened.pdf)

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## PUBLICATIONS

**Dale, A. S.**, Yazdani, S., Ekanayaka, T., Mishra, E., Hu, Y., Dowben, P., ... & Cheng, R. (2023, March). Determination of magnetic anisotropy due to spin-orbit coupling in Fe (II) spin crossover thin film. *American Physical Society March Meeting*.  
<https://meetings.aps.org/Meeting/MAR23/Session/Q57.11>

Boler, W., **Dale, A. S.**, Christopher, L (2022). Trusted Data Anomaly Detection (TaDA) in Ground Truth Image Data. *51<sup>st</sup> Applied Imagery Pattern Recognition Workshop Conference Proceedings*.

**Dale, A. S.**, Qiu, M., Krogg, W., William, A., Christopher, L (2022). CNN-based network has Network Anisotropy – work harder to learn rotated feature than non-rotated feature. *51<sup>st</sup> Applied Imagery Pattern Recognition Workshop Conference Proceedings*.

**Dale, A. S.**, Yazdani, S., Ekanayaka, T., Mishra, E., Hu, Y., Freeland, J., Zhang, J., Dowben, P. A., Cheng, R. (2022). Direct Observation of the Magnetic Anisotropy of an Fe (II) Spin Crossover Molecular Thin Film. *Under review at Journal of Physics: Materials*

Yazdani, S., Collier, K., Yang, G., Philips, J., **Dale, A.S.**, Mosey, A., Grocki, S., Zhang, J., Shanahan, A.E., Cheng, R., Dowben, P.A. (2022). Spectroscopy Study of Isothermal Spin State Switching in a Fe (II) Spin Crossover Molecular Thin Film. *Submitted to Magnetochemistry*  
[10.20944/preprints202208.0454.v1](https://doi.org/10.20944/preprints202208.0454.v1)

**Dale, A. S.**, Hao, G., N'Diaye, A. T., Chopdekar, R. V., Jiang, X., Mellinger, C., Cheng, R., Xu, X., Dowben, P.A. (2022). Intermolecular Interaction and Cooperativity in an Fe(II) Spin Crossover Molecular Thin Film System. *J. Phys. Condensed Matter* 34(29) 295201  
<https://doi.org/10.1088/1361-648X/ac6cbc>

Hao, G., N'Diaye, A. T., Ekanayaka, T., **Dale, A. S.**, Jiang, X., Mishra, E., Mellinger, C., Yazdani, S., Freeland, J., Zhang, J., Cheng, R., Xu, X., Dowben, P.A. (2021). Magnetic field perturbations to a soft X-ray activated Fe (II) molecular spin state transition. *Magnetochemistry*, 7, 37.  
<https://doi.org/10.3390/magnetochemistry7030037>

Ekanayaka, T., Wang, P., Yazdani, S., Phillip, J.P., Mishra., **Dale, A.S.**, N'Diaye, A.T., Klewe, C., Shafer, P., Freeland, J., Streubel, R., Wampler, J.P., Zapf, V., Cheng, R., Shatruk, M., Dowben, P.A. (2022). Evidence of Dynamical Effects and Critical Field in a Cobalt Spin Crossover Complex. *Chem. Comm.* 2022, 58, 661-664. <https://doi.org/10.1039/D1CC05309D>

Ekanayaka, T. K., Hao, G., Mosey, A., **Dale, A. S.**, Jiang, X., Yost, A. J., ... & Dowben, P. A. (2021). Nonvolatile Voltage Controlled Molecular Spin-State Switching for Memory Applications. *Magnetochemistry*, 7(3), 37. <https://doi.org/10.3390/magnetochemistry7030037>

Ekanayaka, T. K., Kurz, H., **Dale, A. S.**, Hao, G., Mosey, A., Mishra, E., ... & Dowben, P. A. (2021). Probing the unpaired Fe spins across the spin crossover of a coordination polymer. *Materials Advances*. <https://doi.org/10.1039/DoMA00612B>

- Mosey, A., **Dale, A. S.**, Hao, G., N'Diaye, A., Dowben, P. A., & Cheng, R. (2020). Quantitative Study of the Energy Changes in Voltage-Controlled Spin Crossover Molecular Thin Films. *The Journal of Physical Chemistry Letters*, 11(19), 8231-8237. <https://doi.org/10.1021/acs.jpcclett.0c02209>
- Chen Z.-H., **Dale A.**, Dale S. (2019). A generalization of Dirac's Theorem for claw-free graphs. *Journal of Combinatorial Mathematics and Combinatorial Computing*. 111: 145-165
- Christopher, L., William, A., Rao, A. S., **Dale, A.**, Chase, A., Joshi, M. P., ... & Abernathy, B. (2018, October). Engineering and Informatics Student Multidisciplinary Learning using 3D Visualization and 3D Display of Radio Frequency (RF) Concepts. In *2018 IEEE Frontiers in Education Conference (FIE)* (pp. 1-5). IEEE. <https://doi.org/10.1109/FIE.2018.8658787>
- Dale, A.** (2013). The Alice Cipher. *Word Ways*, 46(2), 14. <https://digitalcommons.butler.edu/wordways/vol46/iss2/14>

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## SKILLS

<u>Hardware</u>	<u>Software</u>	<u>Languages</u>
<ul style="list-style-type: none"> <li>• Autostereoscopic Displays</li> <li>• Atomic Force Microscope</li> <li>• Basic Electronics skills (Multimeter, Oscilloscope, Soldering, etc.)</li> <li>• Basic fabrication skills (industrial mill, drill press, etc.)</li> <li>• Dye-Pump Laser</li> <li>• High Vacuum Thermal Deposition</li> <li>• Jetson Nano, Xavier</li> <li>• Liquid Helium Cryostat</li> <li>• Microcontroller (Arduino, dsPic33)</li> <li>• Physical Vapor Deposition</li> <li>• Nd-Yag Pulse Laser</li> <li>• Raspberry Pi</li> <li>• SPEX Spectrometer</li> <li>• Wave Form Generators</li> <li>• X-Ray Diffraction</li> </ul>	<ul style="list-style-type: none"> <li>• Adobe Creative Suite</li> <li>• Anaconda</li> <li>• Android Studio</li> <li>• Ansys HFSS</li> <li>• Autodesk Maya</li> <li>• Cadence</li> <li>• Code Warrior</li> <li>• COMSOL Multiphysics</li> <li>• GitHub</li> <li>• Jupyter Lab</li> <li>• Linux Mint, Raspbian, Red Hat, Ubuntu OS</li> <li>• Microsoft Visual Studio</li> <li>• Macintosh OS</li> <li>• Origin</li> <li>• ProEngineer</li> <li>• PSpice</li> <li>• PyCharm</li> <li>• TensorFlow/Keras</li> <li>• Vivado</li> <li>• Windows OS</li> <li>• XCode</li> </ul>	<ul style="list-style-type: none"> <li>• Assembly</li> <li>• Bash</li> <li>• C++</li> <li>• HTML &amp; CSS</li> <li>• Java</li> <li>• LabView</li> <li>• MATLAB</li> <li>• Python</li> <li>• Swift</li> <li>• VHDL</li> <li>• English (Native)</li> <li>• Mandarin Chinese (Intermediate/Advanced)</li> <li>• French (Elementary)</li> <li>• Hindi (Elementary)</li> </ul>