JACK R. CREWSE III

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Webpage · LinkedIn · Google Scholar

EXPERIENCE

Postdoctoral Appointee Aug. 2022 - Present
Center for Nanoscale Materials - Argonne National Laboratory

- Investigated electronic and optical properties of novel helical nanostructures
- Developed high-performance simulations of density-functional theory and tight-binding models
- Formulated detailed notes on theoretical background, methods and analysis
- Advanced analytic theory of electronic properties in helical nanostructures

Graduate Research Assistant June 2016 - July 2022
Missouri University of Science and Technology

- Investigated disordered quantum phase transitions and their dynamical properties
- Developed high-performance Monte Carlo simulations and a custom suite of data analysis tools
- Authored four publications in Physical Review B and Letters
- Delivered group seminars on research and high-performance computing topics
- Twice recognized in department-wide research competition (First place honors 2018 & 2021)

Visiting Research Assistant Sept. 2019 - Mar. 2020
Universität Regensburg (Regensburg, Germany)

- Developed numerical simulation of terahertz laser interaction with topological insulator materials
- Collaborated closely with experimental quantum materials group to guide methods
- Contributed to publications in Nature and Physical Review B
- Recognized in department-wide research competition (First place honors 2020)

Graduate Teaching Assistant Aug. 2017 - May 2021
Missouri University of Science and Technology

- Instructed undergraduate classical mechanics and electromagnetism laboratory courses
- Delivered daily lectures on theoretical background of experiments
- Lead hands-on experiments in electromagnetism and classical mechanics topics
- Prepared detailed notes, diagrams and video lectures outlining experiments
- Taught four semesters with approximately 100 students each

EDUCATION

Missouri University of Science and Technology June 2016 - present
Ph.D in Physics (Defending Fall 2023)

Missouri University of Science and Technology August 2011 - Dec 2015
B.S. in Physics

SKILLS

Programming	Python, Fortran, C++, Linux/Unix, git/github, High-performance computing, Machine learning
Other	LaTeX, Office suites, video editing

PUBLICATIONS

Localization of the Higgs mode at the superfluid-Mott glass transition July 2021
J. Crewse and T. Vojta

Physical Review B **104**, 014511

Tunable non-integer high-harmonic generation in a topological insulator May 2021
C.P. Schmid, J. Crewse, et. al.

Nature **593**, 385-390

Semiconductor-Bloch Formalism: Derivation and Application to High-Harmonic Generation from Dirac Fermions Aug. 2020
J. Wilhelm, P. Grössing, J. Crewse, M. Nitsch, L. Weigl, C. Schmid and F. Evers

Physical Review B **103**, 125419

Collective modes at a disordered quantum phase transition July 2020
M. Puschmann, J. Crewse, J. Hoyos, T. Vojta

Physical Review Letters **125**, 027002

Quantum critical behavior of the three-dimensional superfluid-Mott glass transition Aug. 2018
J. Crewse, C. Lerch, T. Vojta

Physical Review B **98**, 054514

Quantum critical behavior of the superfluid-Mott glass transition Oct. 2016
T. Vojta, J. Crewse, M. Puschmann, Y. Kiselev

Physical Review B **94**, 134501

AWARDS

1st Place Honors (2021) - L.D. Schearer Competition for Graduate Research
1st Place Honors (2020) - L.D. Schearer Competition for Graduate Research
1st Place Honors (2018) - L.D. Schearer Competition for Graduate Research
2nd Place Honors (2014) - H.Q. Fuller Undergraduate Research Competition

REFERENCES

Thomas Vojta (Ph.D Advisor)
Curators' Distinguished Professor and Chair - Missouri University of S&T
vojtat@mst.edu

Ferdinand Evers
Chair of Computational Condensed Matter Theory - University of Regensburg
ferdinand.evers@ur.de

Ulrich Jentschura
Professor of Physics - Missouri University of S&T
ulj@mst.edu