Christian Bunker

cpbunker.github.io

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Education

- **University of Florida** — Gainesville, FL
  Ph.D. in Physics — *August 2020 - Present*
- **University of Notre Dame** — Notre Dame, IN
  B.S. in Physics, magna cum laude — *August 2016 - December 2019*
  - **Concentration**: Advanced Physics.
  - **Honors**: Outstanding Undergraduate Research Award.

Publications & Presentations

- **C. Bunker**, S. Hoffman, J.-X. Yu, X.-G. Zhang, and H.-P. Cheng. "Scattering for entangled state switching in molecular dimers." Sanibel Symposium (2022).
- L. Riney, **C. Bunker**, S.-K. Bac, J. Wang, D. Battaglia, Y. C. Park, M. Dobrowolska, J.K. Furdyna, X. Liu, B.A. Assaf. "Introduction of Sr into Bi_2Se_3 thin films by molecular beam epitaxy." J. Appl. Phys. 129, 085107 (2021).
- J. Wang, X. Liu, **C. Bunker**, L. Riney, B. Qing, S.K. Bac, M. Zhukovskyi, T. Orlova, S. Rouvimov, M. Dobrowolska, J.K. Furdyna, B.A. Assaf. "Weak antilocalization beyond the fully diffusive regime in $Pb_{1-x}Sn_xSe$ topological quantum wells." Phys. Rev. B 102, 155307 (2020).

Research

- **Research Assistant, University of Florida** — Gainesville, FL
  Dr. Hai-Ping Cheng — *April 2021 - Present*
  - Created Python code for treating single electron scattering from magnetic molecules using Green's function techniques.
- **Research Assistant, University of Notre Dame** — Notre Dame, IN
  Dr. Badih Assaf — *January 2020-May 2020*
  - Used numerical methods to investigate the energies and dispersion relations of bound states in band gap inverted IV-VI quantum wells.
  - Investigated SrBiSe and CuBiSe using x-ray diffraction, Raman spectroscopy, and Fourier-transform infrared spectroscopy.
  - Performed low temperature magnetotransport experiments on α-Sn thin films to investigate evidence for superconductivity.
  - Developed a simple numerical model for accounting for the exchange effects of introducing paramagnetic ions into lead salts and calculating subsequent band levels.
- **Research Assistant, CERN** — Geneva, Switzerland
  Dr. Josh Bendavid — *January 2019 - June 2019*

- Investigated the effects of applying angular smoothing theory derived from QCD to leptonic W decays.
- Created Python and Root code to analyze data from Monte Carlo simulated W decay events.

- **Research Assistant, University of North Florida** Jacksonville, FL
  Dr. Daniel Santavicca *May 2018 - August 2018*
  - Researched improvements to superconducting nanowire single photon detectors (SNSPDs) using AWR Design Environment circuit design software.
  - Designed and simulated exotic circuit elements in order to determine how nanowire geometry affects the dispersion, resonance, and detection capabilities of SNSPDs.

Experience

- **Teaching Assistant, University of Florida** Gainesville, FL
  Dept. of Physics *August 2020 - May 2021*
  - Graded Physics 1 lab reports, provided quiz preparation and homework explanation to Physics 2 students.

- **Physics Tutor, University of Notre Dame** Notre Dame, IN
  Academic Services for Student Athletes *August 2019 - December 2019*
  - Supported student athletes in Engineering Physics I and II classes.

- **Physicist Assistant, Ackerman Cancer Center** Jacksonville, FL
  Department of Physics and Dosimetry *May 2018 - August 2018*
  - Performed quality assurance checks on the proton therapy machine using myQA software to ensure proper strength and calibration of the beam.
  - Implemented quality assurance checks on beam apertures and range compensators using .decimal software to ensure that each is properly tailored to the dosimetry plan of the specific patient.

Skills

- **Programming:** Excellent grasp of Python, including Numpy, Matplotlib, PySCF