

# Thomas Bsaibes

## CONTACT DETAILS

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## WORK EXPERIENCE

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### Purdue School of Science, Indianapolis IN

2016-2023

#### *Graduate Researcher:*

- Developed system to measure theorized fifth forces.
- System is sensitive to Yukawa-like interactions.
- Enhanced sensitivity over older studies by an order of magnitude.
- Mentored undergraduate researcher in instrumentation, through construction of miniature Watt-balance.

#### *Graduate Teaching Assistant:*

- Led physics recitation courses.
- Presented problems and problem solving techniques to under grad students.
- Instructed undergraduate physics lab courses.
- Set up and tested laboratory equipment before lab courses.
- Held office hours for students who needed extra help.

### NHMFL, Los Alamos National Laboratory

2022

#### *Visiting Graduate Researcher:*

- Worked as a researcher under the supervision of Dr. Marcelo Jaime
- Ran magnetostriction experiments.
- Supported users during pulsed magnetic field experiments.
- Set up and started running an experiment to measure the harmonics of a aluminium rod.
- Used DMRG techniques to reproduce theoretical results.
- Designed mounting bracket to attach a camera to a spectrometer.

### DePaul University, Chicago IL

2014-2016

#### *Graduate Researcher:*

- Studied conduction properties of transparent conducting oxide In-O.
- Analyzed the structure of oxides with a radial distribution function.
- Correlated the sample structure to conduction properties.

#### *Graduate Teaching Assistant:*

- Aided professors in teaching the undergraduate physics courses during lecture.
- Set up and tested laboratory equipment before lecture.
- Answered students questions during lecture.
- Held office hours for students who needed extra help.

## University of Illinois at Chicago

2012-2014

### *Volunteer Research Assistant*

- Studied surfactant organization at a liquid-liquid interface with Brewster angle microscope.
- Prepped samples, gathered data, and conducted preliminary analysis of data.
- Performed routine maintenance.

## EDUCATION

### Ph.D. Physics

2016-2023

*Purdue School of Science, Indianapolis IN*

Thesis: Short range Probes to Extensions of the Standard Model

### M.S. Physics

2014-2016

*DePaul University, Chicago IL*

Thesis: A Study of Amorphous and Crystalline Transparent Conducting Oxides' Structures Through Radial-Distribution Functions

### B.S. Physics

2010-2014

*University of Illinois at Chicago*

## SKILLS

*Hardware:* Lockin Amplifier, Position Sensitive Detectors, Capacitance Bridge, Scanning Electron Microscope (SEM), Profilometer, Brewster Angle Microscope, Raspberry Pi, Arduino

*Fabrication:* Greyscale Lithography, Printed Circuit Board (PCB) Design, Milling Machine, Lathe

*Software:* CNST Nanolithography Toolbox, LabVIEW, COMSOL Multiphysics, MATLAB, GSAS II, PDFGETX3, PDFGUI, Blender, FreeCAD, EasyEDA,  $\text{\LaTeX}$

*Languages:* Python

## CONFERENCE PRESENTATIONS

### American Physics Society April Meeting

2021

*Title: Macroscopic Approach for Improving Yukawa-Like Interaction Limits*

Authors: **Thomas Bsaibes**, Luis Pires, Ricardo Decca

### GR22/Amaldi 13 Conference

2019

*Title: Setting Stronger Dark Sector Limits on Monopole-Monopole and Monopole-Dipole Interactions Using Cylinders*

Authors: **Thomas Bsaibes**, Luís Pires, Aaron Mosey, Saeed Yazdani, David Czaplewski, Daniel Lopez, and Ricardo Decca

**American Physics Society April Meeting**

2019

*Title: Improving Short Range Gravity Limits With Cylinders*

Authors: **Thomas Bsaibes**, Luís Pires, David Czaplewski, Daniel Lopez, and Ricardo Decca

**Indiana Academy of Science Annual Meeting**

2019

*Title: Improving Short Range Gravitation Limits Using Cylinders*

Authors: **Thomas Bsaibes**, Luís Pires, David Czaplewski, Daniel Lopez, and Ricardo Decca

**Denver X-ray Conference**

2016

*Title: Using Radial Distribution Function to Analyze the Structure of Indium Oxide*

Authors: **Thomas Bsaibes** and G.B. Gonzalez Aviles

## PUBLICATIONS

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- [1] **Thomas Bsaibes**, L. Pires, D. Czaplewski, D. López, and R. S. Decca, “Toward a better system for short range precision force measurements,” *Modern Physics Letters A*, vol. 35, 03 2020. DOI: [10.1142/S0217732320400027](https://doi.org/10.1142/S0217732320400027).
- [2] A. W. Schuman, **Thomas S. Bsaibes**, and M. L. Schlossman, “Microphase formation at a 2d solid–gas phase transition,” *Soft Matter*, vol. 10, pp. 7353–7360, 37 2014. DOI: [10.1039/C4SM01197J](https://doi.org/10.1039/C4SM01197J).

## AWARDS & HONORS

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**Awarded**

2023

*School of Science Outstanding Graduate Student Award*

**Awarded**

2022

*SMART Scholarship*

**Nomination**

2021

*Google PhD. Fellowship*