

# Theodore A. Corcovilos, Ph.D.

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## EDUCATION

### CALIFORNIA INSTITUTE OF TECHNOLOGY

#### PHD IN PHYSICS

June 2008 | Pasadena, CA

Dissertation: *Fluid Phase Thermodynamics*

Advisor: Nai-Chang Yeh

### UNIVERSITY OF TENNESSEE, KNOXVILLE

#### BA IN COLLEGE SCHOLARS (PHYSICS, MATH)

May 1999 | Knoxville, TN

Summa Cum Laude

## LINKS

Github: [corcoted](#)

LinkedIn: [ted-corcovilos](#)

Twitter: [@TedCorcovilos](#)

ORCID: [0000-0001-5716-1188](#)

## SKILLS

### HARDWARE

Imaging Optics

Lasers (MIR, NIR, Vis, UV; diodes, FEL, fiber lasers, Ti:Sapphire, Nd:YAG)

Fiber Optics

Acousto-Optics

Electro-Optics

Analog and digital electronics

Microwave electronics

MEMS

Microscopy

Ultra-high Vacuum

Cryogenics (2K)

Arduino

NI DAQ racks

### SOFTWARE

Python

C/C++

Fortran

Matlab

Mathematica

LabView

Zemax

Solidworks

Javascript

L<sup>A</sup>T<sub>E</sub>X

MS-Office

Windows

Linux

Slack

## EXPERIENCE

### DUQUESNE UNIVERSITY | ASSISTANT PROFESSOR OF PHYSICS

Aug 2013 – Present | Pittsburgh, PA

- Teaching of undergraduate lecture and lab courses in Optics, Quantum Mechanics, Electrodynamics, and Electronics
- Proposed and managed multi-year research projects with \$500k-level budgets
- Mentored teams of undergraduate students in a research setting
- Experimental research in ultracold atom physics, optics, spectroscopy of gas-phase molecular ions, environmental sensing

### PENNSYLVANIA STATE UNIVERSITY | POSTDOC RESEARCHER

Apr 2010 – June 2013 | University Park, PA

Supervisor: David S. Weiss

Quantum computing experiment using ultracold neutral atoms as qubits.

### RICE UNIVERSITY | POSTDOC RESEARCHER

Aug 2007 – March 2010 | Houston, TX

Supervisor: Randy Hulet

Quantum simulation experiment of fermions in a cubic lattice.

## CURRENT PROJECTS

### 2D QUASICRYSTALS | PI

Jan 2014 -- Present

Experiment to realize analogs of 2D quasicrystals using ultracold atoms in optical interference potentials.

### IRMPD OF GAS-PHASE MOLECULAR IONS | Co-PI

Jan 2015 -- Present

Infrared Multiphoton Dissociation spectroscopy using mid-IR free-electron lasers to characterize the structure of gas-phase molecular ion complexes of uranium. Collaboration with Michael Van Stipdonk (Duquesne Univ., Chemistry).

### DETECTION OF WATER CONTAMINANTS | Co-PI

May 2015 -- Present

Design and use of inexpensive home-built color and fluorescence detectors of lead, fluoride, and other contaminants in drinking water. Collaboration with Partha Basu (IUPUI, Chemistry) and David Kahler (Duquesne, Environmental Science).

## SELECTED PUBLICATIONS

Theodore A. Corcovilos and Jahnavee Mittal. Two-dimensional optical quasicrystal potentials for ultracold atom experiments. *Applied Optics*, 58(9):2256–2263, 2019. doi:10.1364/AO.58.002256.

Theodore A. Corcovilos. A simple game simulating quantum measurements of qubits. *American Journal of Physics*, 86(7):510–517, 2018. doi:10.1119/1.5036620.

Yang Wang, Xianli Zhang, Theodore A. Corcovilos, Aishwarya Kumar, and David S. Weiss. Coherent addressing of individual neutral atoms in a 3D optical lattice. *Physical Review Letters*, 115:043003, 2015. doi:10.1103/PhysRevLett.115.043003.

T. A. Corcovilos, S. K. Baur, J. M. Hitchcock, E. J. Mueller, and R. G. Hulet. Detecting antiferromagnetism of atoms in an optical lattice via optical Bragg scattering. *Physical Review A*, 81(1):013415, 2010. doi:10.1103/PhysRevA.81.013415.

S. E. Pollack, D. Dries, M. Junker, Y. P. Chen, T. A. Corcovilos, and R. G. Hulet. Extreme tunability of interactions in a <sup>7</sup>Li Bose-Einstein condensate. *Physical Review Letters*, 102(9):090402, 2009. doi:10.1103/PhysRevLett.102.090402.