

## JOHN EMIL PETERSEN III, PHD, MS

Full Stack Dev | CAD | Materials Science | Physics | Engineering | Control Systems | Consulting

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<https://github.com/Tarbalreboot> | <https://orcid.org/0000-0001-7476-3690>

### Professional Experience

#### **Business Owner**

Jan 2018 –

##### **N-Dimensional Technologies, LLC**

- ∞ Developed robotic positioning system (mount) from scratch for Alt-Az telescopes
- ∞ Achieved a level of performance appropriate for professional data acquisition
- ∞ Secured intellectual property such that valuation exceeds \$100 million
- ∞ <https://www.youtube.com/embed/1IRl16R1wuE>

#### **Research Associate**

Jan 2012 – Dec 2017

##### **Texas State University, Department of Physics**

- ∞ Calculated physical properties of novel materials via quantum mechanical first-principles
- ∞ Utilized Linux high-performance computing clusters to compile, run, and/or write various scientific programs using C/C++ and bash
- ∞ Characterized structural and electronic properties of materials via x-ray diffraction, atomic force microscopy, and Hall measurements, often using LabView
- ∞ Presented original results at professional society conferences and in peer-reviewed journals

#### **Teaching Assistant**

Aug 2011 – May 2015

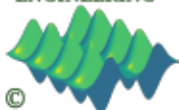
##### **Texas State University, Department of Physics**

- ∞ Introduced students to fundamental laws of electrodynamics and basic electrical engineering principles, through lecture and demonstration
- ∞ Became exceptionally familiar with circuits and their components

**Various other previous positions, including Financial Adviser**

### Skills

- ∞ Demonstrated hard coding and mathematical modeling ability with C/C++, linking libraries
- ∞ Seasoned scripting skills with bash, awk, and C#
- ∞ Versed in Linux and Windows, whether in the terminal or Visual Studio, HPCC or webserver
- ∞ Well-practiced in both relational (SQL) and key-pair (non-SQL) development and query
- ∞ Gifted at presenting, communicating, and educating at numerous public speaking events
- ∞ Skilled in materials characterization by XRD, AFM, and Hall measurements
- ∞ Talented with both CAD and shop tools, bringing design to prototype
- ∞ Skilled with electronics workbench, wet lab, mechanics, and power tools



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### Education

#### **PhD, Materials Science and Engineering**

**Dec 2017**

##### **Texas State University**

*“Impurities in Antiferromagnetic Transition-Metal Oxides – Symmetry and Optical Transitions”*

GPA: 3.74

#### **Master of Science, Physics**

**May 2013**

##### **Texas State University**

*“First Principles Study of Structural, Electronic, and Mechanical Properties of Lead Selenide and Lead Telluride”*

GPA: 3.13, Excellence in Graduate Research Award

#### **Bachelor of Science, Physics**

**Dec 2010**

##### **University of Texas at San Antonio**

GPA: 3.34

∞ Co-founder and treasurer of local branch of Society of Physics Students

∞ Best Paper award at ABES Student Conference, 2010

#### **Bachelor of Arts, Liberal Arts**

**Aug 2005**

##### **University of Texas at Austin**

∞ Minor in Business Foundations

∞ Studied abroad at ESADE, in Barcelona, Spain

### Oral Presentations at National Conferences

#### **APS March Meeting, New Orleans, LA**

**Mar 2017**

Ab Initio study on structural, electronic, magnetic and dielectric properties of LSNO within Density Functional Perturbation Theory, J. Petersen, et al.

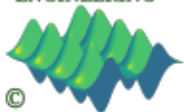
<http://meetings.aps.org/link/BAPS.2017.MAR.A8.2>

#### **APS March Meeting, Baltimore, MD**

**Mar 2016**

First Principles Study of Oxygen Vacancies and Iron Impurities on Electrical and Optical Properties of NiO, J. Petersen, et al.

<http://meetings.aps.org/link/BAPS.2016.MAR.Y30.9>



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### Publication List

11. Symmetry Considerations on Band Filling and First Optical Transition in NiO, J. Petersen, et al., **The European Physical Journal B** (2019) 92: 232.  
<https://doi.org/10.1140/epjb/e2019-100363-5>
10. Spontaneous symmetry breaking and electronic and dielectric properties in commensurate  $\text{La}_{7/4}\text{Sr}_{1/4}\text{CuO}_4$  and  $\text{La}_{5/3}\text{Sr}_{1/3}\text{NiO}_4$ , J. Petersen, et al., **Physical Review B** 97 (195129).  
<https://doi.org/10.1103/PhysRevB.97.195129>
9. Carrier Lifetimes of Iodine-Doped CdMgTe/CdSeTe Double Heterostructures Grown by Molecular Beam Epitaxy, S. Sohal, et al., **Journal of Electronic Materials** 46 (9).  
<https://doi.org/10.1007/s11664-017-5646-y>
8. Iodine Doping of CdTe and CdMgTe for Photovoltaic Applications, O.S. Ogedengbe, et al., **Journal of Electronic Materials** 46 (9).  
<https://doi.org/10.1007/s11664-017-5588-4>
7. Electronic and Optical Properties of Antiferromagnetic Iron Doped NiO – A First Principles Study, J. Petersen, et al., **AIP Advances** 7 (5).  
<https://doi.org/10.1063/1.4975493>
6. Effect of Free-Carrier Concentration and Optical Injection on Carrier Lifetimes in Undoped and Iodine Doped CdMgTe/ CdSeTe Double Heterostructures Grown by Molecular Beam Epitaxy, S. Sohal, et al., **Journal of Physics D Applied Physics** 49 (50).  
<http://stacks.iop.org/0022-3727/49/i=50/a=505104>
5. Factors Influencing Photoluminescence and Photocarrier Lifetime in CdSeTe/CdMgTe Double heterostructures, C. Swartz, et al., **Journal of Applied Physics** 120 (16).  
<https://doi.org/10.1063/1.4966574>
4. Ab Initio Study of Oxygen Vacancy Effects on Electronic and Optical Properties of NiO J. Petersen, et al., **MRS Advances** 1 (37).  
<https://doi.org/10.1557/adv.2016.405>
3. The Effect of Anisotropic Valleys on Phonon Scattering and the Magnetotransport Properties of n-Type PbTe, C. Swartz, et al., **Journal of Electronic Materials** 45 (1).  
<https://doi.org/10.1007/s11664-015-4184-8>
2. Thermoelectric Properties of IV-VI-Based Heterostructures and Superlattices, P. Borges, et al., **Journal of Solid State Chemistry** 227 (123).  
<https://doi.org/10.1016/j.jssc.2015.03.027>
1. Elastic and Mechanical Properties of Intrinsic and Doped PbSe and PbTe Studied by First-Principles, J. Petersen, et al., **Materials Chemistry and Physics** 146 (3).  
<https://doi.org/10.1016/j.matchemphys.2014.03.055>