

# Nicholas D. Haynes

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## CURRICULUM VITAE

### EDUCATION

#### **PhD, Physics**

##### **Duke University**

Entered: May, 2013

Expected graduation: May, 2018

#### **MS, Applied Mathematics**

##### **University of Dayton**

Graduated: May, 2013

#### **BS, Honors with Distinction, Magna Cum Laude**

##### **University of Dayton**

Majors: Physics, Philosophy

Minor: Mathematics

Graduated: August, 2011

### PUBLICATIONS

- N. D. Haynes, M. C. Soriano, D. P. Rosin, I. Fischer, and D. J. Gauthier, "Reservoir computing with a single time-delay autonomous Boolean node," *Physical Review E* 91, 020801 (2015).
- D. P. Rosin, D. Rontani, N. D. Haynes, E. Scholl, and D. J. Gauthier, "Transient scaling and resurgence of chimera states in networks of Boolean phase oscillators," *Physical Review E* 90 (2014).
- D. C. Harris, L. F. Johnson, R. T. Seaver, T. Lewis, G. Turri, M. Bass, D. E. Zelmon, and N. D. Haynes, "Optical and thermal properties of spinel with revised (increased) absorption at 4-5  $\mu\text{m}$  wavelengths and comparison with sapphire," *Optical Engineering* 52, 8 (2013).
- D. E. Zelmon, J. M. Northridge, N. D. Haynes, D. Perlov, and K. Petermann, "Temperature-dependent Sellmeier equations for rare-earth sesquioxides" *Applied Optics* 52, 16 (2013).
- A. Joshi, N. D. Haynes, D. E. Zelmon, O. Stafsudd, and R. Shori, "Impurity concentration and temperature dependence of the refractive indices of  $\text{Er}^{3+}$  doped ceramic  $\text{Y}_2\text{O}_3$ ," *Optics Express* 20, 4 (2012).

### CONFERENCE PRESENTATIONS

- N. D. Haynes, S. Apostel, O. D'Huys, and D. J. Gauthier, "Information processing in time-delay autonomous Boolean networks," poster presented at Network Frontier Workshop, Evanston, IL, December 2015.
- N. D. Haynes, O. D'Huys, and D. J. Gauthier, "Extreme transients in time-delay autonomous Boolean networks," poster presented at NetSci 2015, Zaragoza, Spain, June 2015.
- N. D. Haynes, M. C. Soriano, D. P. Rosin, I. Fischer, and D. J. Gauthier, "Physical reservoir computing with Boolean logic," poster presented at Dynamics Days US XXXIV, Houston, TX, January 2015.
- N. D. Haynes, D. P. Rosin, M. C. Soriano, I. Fischer, and D. J. Gauthier, "Reservoir computing with a single autonomous Boolean node using time-delay feedback," presented at Workshop on Wireless Intelligent Sensor Networks, Durham, NC, June 2014.
- N. D. Haynes, D. P. Rosin, D. Rontani, and D. J. Gauthier, "Towards reservoir computing with autonomous Boolean networks," poster presented at Dynamics Days US, Atlanta, GA, January 2014.
- N. D. Haynes and D. E. Zelmon, "Optical and spectroscopic properties of Ytterbium-doped YAG," *Proc. Of SPIE Vol. 8599*, presented at SPIE Photonics

West, San Francisco, CA, February 2013.

- N. D. Haynes, D. E. Zelmon, and R. Shori, "Refractive indices and thermo-optic coefficients of Erbium-doped Yttria," Proc. of SPIE Vol. 8235, presented at SPIE Photonics West, San Francisco, CA, January 2012.

## **RESEARCH EXPERIENCE**

### **May 2013 – Present**

- Experimental study of time-delay autonomous Boolean networks and applications for machine learning
- Advisor: Dr. Daniel Gauthier, Department of Physics, Duke University

### **January 2012 – May 2013**

#### **Master Thesis Project**

- Development of mesh-less computational methods for nonlinear partial differential equations
- Advisor: Dr. Muhammad Usman, Department of Mathematics, University of Dayton

### **October 2009 – May 2013**

#### **Student Research Contractor, Air Force Research Laboratory**

- Theoretical and computational modeling of thermal and spectroscopic properties of novel optical materials
- Experimental characterization of optical materials
- Advisor: Dr. David Zelmon, Materials and Manufacturing Directorate, Air Force Research Laboratory

### **January 2010 – May 2011**

#### **Undergraduate Honors Thesis**

- Theoretical investigation of quantum correlations and implications for nuclear magnetic resonance quantum computing
- Advisor: Dr. Leno Pedrotti, Department of Physics, University of Dayton

## **TEACHING EXPERIENCE**

### **Fall 2012**

**Instructor**, Introductory Calculus

### **Fall 2010**

**Student mentor**, "Introduction to the university" mini-course for first-year students

### **Spring 2010**

**Teaching assistant**, Elementary physics

### **Fall 2009**

**Teaching assistant**, Introductory philosophy

### **January 2009 – December 2009**

**Tutor**, Introductory philosophy

## **AWARDS AND FELLOWSHIPS**

- Wireless Intelligent Sensor Networks IGERT traineeship, 2013 – 2015
- Rocco M. Donatelli Award to the Senior with the Strongest Record in the Humanities and the Sciences, 2011
- Sigma Pi Sigma Award of Merit to Senior in Physics, 2011
- Award of Excellence to the First Outstanding Senior in Philosophy, 2011
- Award to the Senior with Outstanding Contributions to University Bands, 2011
- Award of Excellence to the Outstanding Junior Majoring in Philosophy, 2010
- Music Talent Scholarship, 2007 – 2011
- President's Academic Scholarship, 2007 – 2011
- Eagle Scout Award, 2003