# LEI MA

#### **BASICS**

- US Address: 1919 Lomas Blvd NE, Albuquerque, NM 87131, USA

- Mobile: +1 505-800-9663

- **Email:** leima137@gmail.com (alternative: leima@unm.edu)

## **EDUCATION**

- 08/2013 to now,

Master of Science, Physics, Non-thesis, Expected 05/2016 University of New Mexico, Albuquerque, New Mexico, USA GPA: 4.01/4.33

- 09/2010 to 10/2012,

No degree, Physics Fudan University, Shanghai, China GPA: 3.02/4.00

- 09/2006 to 06/2010,

Bachelor of Science, Physics Shandong University, Jinan, China National Science Talents Training Base in Physics. GPA: 3.78/4.00 (Average: 90.89/100)

## **SKILLS**

- **Programming** Python, Mathematica, C

- **Presentation:** Have presented many topics on physics and astrophysics.

# **BACKGROUND KNOWLEDGE & RESEARCHES**

- Biophysics

Took a biophysics course, with topics ranging from cell membrane to neuroscience and bio-imaging. **Project:** Why saltatory conduction of neurons shouldn't work theoretically?

- Artificial Neural Network

Using artificial neural network to solve differential equations.

- Statistical Physics

Both equilibrium statistical mechanics and non-equilibrium statistical mechanics with master equations and the simple applications to biology and ecology. Wrote a complete set of online statistical physics notes, including equilibrium and non-equilibrium statistical physics.

- Theoretical Physics

Quantum Field Theory: symmetries, quantum electrodynamics, weak interaction

Neutrino Physics: neutrino oscillations, neutrino interaction with matter, supernova neutrinos

**Cosmology:** harmonic model, several dark energy models, matter power spectrum, supernova data fitting

Gravity Theory: general relativity, f(R) theory

**Astrophysics:** compact objects, high energy astrophysics

- Piezoelectric Material

High temperature piezoelectric ceramics

#### **CURRENT RESEARCH**

- Neutrino oscillations in matter, stimulated neutrino oscillations in matter, quantum two level system.
- Application of artificial neural network in differential equation solving.

## **PUBLICATIONS**

- Lei Ma, Kun Zhao, Jixia Li and Hongze Zhang, *The Modification of Malus Law for Depolarized Polaroid and Experimental Verification, College Physics* **29**, 58 (2010).
- Lei Ma, Kun Zhao, Jixia Li, Qi Wu, Minglei Zhao, Chunlei Wang, Dielectric and Piezoelectric Properties of (Li,Ce) Modified NaBi5Ti5O18 Composite Ceramics, Journal of Rare Earths 27, 496 (2009).

#### **HONORS AND AWARDS**

## - Scholarships

First Prize of Excellent Undergraduate Scholarship, 2007 Third Prize of Excellent Undergraduate Scholarship, 2008 Second Prize of Excellent Undergraduate Scholarship, 2009 Individual Scholarship, 2009

#### - Awards

First Prize of May-4th Academic Contest, 2008 Third Prize of May-4th Academic Contest, 2008 Second Prize of Innovation in Science and Technology for College Students of Shandong Province in China, 2009

### TEACHING & EXTRACURRICULAR

## - Teaching

2011 Spring: physics lab teaching assistant at Fudan University 2012 Spring: physics lab teaching assistant at Fudan University 2013 Fall - 2014 Fall: teaching assistant at the University of New Mexico

# - Extracurricular

Member of Jizhi Club: Jizhi club is a research institute without fences, where a group of young scientists all over the world discussing and working on interdisciplinary science. I participated in discussions on complex systems and human dynamics. At this point, I am co-organizor of an online reading club of computational neuroscience.

Column Writer: I am a column writer on douban.com, which is one of the biggest ebook publisher in China. My writing is about how to use real on going research in science fiction.

## LINKS TO PROJECTS MENTIONED ABOVE

- Slides used in presentations at the University of New Mexico: https://speakerdeck.com/emptymalei
- $\hbox{-} \textbf{Statistical physics on line notes:} \ \texttt{http://statisticalphysics.openmetric.org}$
- Neutrino physics research notes: http://docs.neutrino.xyz/
- Neutrino physics codes: https://github.com/NeuPhysics/
- Mathematica programs for cosmological perturbation symbol calculations and simple data fitting:

CoMaPack https://github.com/CosmologyTaskForce/CoMaPack CoChiSquare https://github.com/CosmologyTaskForce/CoChiSquare