

LEI MA

Department of Physics and Astronomy,
1919 Lomas Blvd NE,
Albuquerque, NM 87131, USA

Mobile: +1 5058009663
Email: leima@unm.edu

BASIC

Name: Lei Ma

Birthday: 08/29/1988

EDUCATION

08/2013 to now,

PhD Candidate

University of New Mexico, Albuquerque, New Mexico, USA

08/2013 to 05/2016,

Master of Science, Physics, Non-thesis

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-organizer 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>
- Statistical physics online notes: <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>