CHEN XINGZHUO

chenxingzhuo@tamu.edu

OBJECTIVE

Data Mining in Astrophysics Research Tera-bytes of night-sky photos and optical spectra, which are snatched from big sky survey programs like SDSS, ushers astronomers into a new era of physics. Albeit the discovery of many erratic transients (like the double neutron star merger event GW170817), what is behind the rest data is still under-discovered due to the lack of novel and potent methods. My interest is to find the new physics behind the big data, including physical simulation on high-energy astrophysical phenomena, real-time target detection and classification in sky-survey programs, especially the deep-learning application on supernovae' and galaxies' spectral data.

EDUCATION

Bachelor of Physics Sept 2015 - June 2019
Top-North Innovative Talent Project, College of Physics.
Sichuan University, China, GPA: 3.66/4.00

Dissertation Defense & Research Sept 2018 - July 2019
Chinese Center for Antarctic Astronomy
Purple Mountain Observatory, China.

Ph.D Astronomy August 2019 - July 2024
Department of Physics and Astronomy
Texas A & M University

COMPUTER SKILLS

Language	R, Python, IDL (Beginner), Julia (Beginner).
Algorithms	Deep-Learning, Machine Learning, Monte Carlo simulations.
Platforms	TAMU HPRC, NERSC

PROJECTS

Deep Learning on Synthetic type Ia Supernovae Spectra Sept. 2018 - Now
Major Project *Purple Mountain Observatory*

- Utilize radiation transfer code TARDIS to generate 100k type Ia spectra.
- Apply a 16-layered multi-residual neural network to predict the element abundances from the spectra.
- Discuss the supernova light curves and Ni element abundance relations.
- Paper accepted, Artificial Intelligence Assisted Inversion (AIAI) of Synthetic Type Ia Supernova Spectra.

Finding Transient Targets Using Convolutional Neural Network Sept. 2018 - Now
Collaborative *Purple Mountain Observatory*

- Lei Hu developed an image subtraction algorithm using GPU to accelerate the calculation.
- Based on this algorithm, I trained a neural network to filter the artifact targets and keep the real transients.
- I found 3 possible supernovae, AT 2018gzs, AT 2018gzr and AT 2018gzq.
- We are using this algorithm on a new observation run DECam 2020A-0335.

Mn-doped Nanodot Embedded Silica Nanowires Feb. 2017 - June. 2019
Major Project *Sichuan University*

- Synthesized Mn-doped amorphous silicon oxide nanowires using thermo deposition method.
- Under the TEM, we observed Mn-concentrated dots with size of 3 nm inside nanowires.
- Ostwald Ripening process is applied to explain the growth mechanism of Mn dots inside the nanowire.

· Paper published, Synthesis and growth mechanism of Mn-doped nanodot embedded silica nanowires.

INTERNSHIP/TRAININGS

Physics Summer School, Hertford College, Oxford University — August 2016
Tsinhua University Summer School for Astrophysics — July 2017

PUBLICATIONS

Xingzhuo Chen, Lei Hu and Lifan Wang. Artificial Intelligence Assisted Inversion (AIAI) of Synthetic Type Ia Supernova Spectra.

Xingzhuo Chen, Danqing Zhang, Xi Zhang, Yong Liu, Xueyan Li and Gang Xiang. Synthesis and growth mechanism of Mn-doped nanodot embedded silica nanowires.

Xingzhuo Chen, Shihao Kou and Xuewen Liu An New Method to Classify Type IIP/IIL Supernovae Based on their Spectra.