Kyle Finner

PhD Student
Yonsei University
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Research Interests

Gravitational lensing – Dark matter – Large-scale structure
Merging galaxy clusters – Diffuse radio emission – Telescope instrumentation

Education

Yonsei University, Seoul, South Korea
February 2021 (Projected) Ph.D., Astronomy
Thesis title: Weak Lensing of 30 Radio Relic Merging Galaxy Clusters
Supervisor: Prof. Myungkook James Jee

February 2018 M.S., Astronomy
Thesis title: A Weak-lensing Analysis of the Double Radio Relic Galaxy Cluster PLCKG287.0+32.9
Supervisor: Prof. Myungkook James Jee

University of Victoria (UVic), Victoria, Canada
May 2015 B.Sc., Honours Combined Physics and Astronomy with work experience
Thesis title: Star Formation Rate Enhancements for Primary and Secondary Galaxies in Mergers
Supervisor: Prof. Sara Ellison

May 2007 B.A., Economics and Greek and Roman Studies

Professional Experience

June 2015 – March 2016
Research Assistant, Yonsei University
- Developed Python scripts to measure HI line-widths
- Inferred distances to galaxies via the Tully-Fisher relation
- Investigated pre-processing of galaxies in the Virgo cluster filament structure

January 2015 – April 2015
Honours Project – Statistical analysis of SDSS galaxy mergers, UVic
- Accessed SDSS tables with MySQL queries embedded in Python scripts
- Performed statistical analysis of galaxies in merging events
- Investigated star formation rate enhancements induced in merging galaxies

April 2014 – January 2015

Co-I, SWEEP – Search for White Dwarf Eclipsing ExoPlanets, UVic

- Created a simulation for white dwarf / exoplanet orbits in Python
- Modeled the light curve of an exoplanet transiting a white dwarf
- Collected photometric data at the Plaskett, 1.8m telescope (20 nights)
- Reduced the images in IRAF
- Produced light curves by photometry with Source Extractor

May 2012 – December 2014

Volunteer, UVic, Bob Wright Building Observatory

- Conducted tours of the Observatory at UVic
- Operated the 0.8m telescope
- Promoted astronomy to the public

August 2012 – January 2013

Co-op Student, Tokyo University of Marine Science and Technology, Tokyo, Japan

- Processed oceanographic data using MATLAB
- Wrote MATLAB scripts to process data
- Gave weekly PowerPoint presentations on progress and findings

PUBLICATIONS

2020 Astrophysical Journal Letters

- Evidence of runaway gas cooling in the absence of supermassive black hole feedback at the epoch of cluster formation

Hlavacek-Larrondo, Rhea, Webb, McDonald, Muzzin, Wilson, **Finner**, Valen, Bonaventura, Cooper, Fabian, Gendron-Marsolias, Jee, Lidman, Mezcua, Noble, Russel, Surace, Trudeau, Yee

2020 Astrophysical Journal

- FIRST RESULTS FROM THE ASKAP-EMU PILOT SURVEY: Discovery of a Radio Relic in the Massive Merging Cluster SPT-CL~2023-5535

Hyeonghan, Jee, Rudnick, Parkinson, **Finner**, Yoon, Lee, Brunetti, Brüggen, Collier, Hopkins, Michalowski, Norris, Riseley

2020 Astrophysical Journal https://arxiv.org/abs/2006.13535

- Toward Solving the Puzzle: Dissecting the Complex Merger A521 with Multi-wavelength Data

Yoon, Lee, Jee, **Finner**, Smith, Kim

2020 Astrophysical Journal https://arxiv.org/abs/2002.01956

- Constraining the Mass of the Emerging Galaxy Cluster SpARCSJ1049+56 with Infrared Weak Lensing

Finner, Jee, Webb, Wilson, Perlmutter, Muzzin, Hlavacek-Larrondo

2019 Astrophysical Journal https://arxiv.org/abs/1812.08797

- Multiwavelength Analysis of the Merging Galaxy Cluster A115

Kim, Jee, **Finner**, Golovich, Wittman, van Weeren, Dawson

2019 Astrophysical Journal Supplement https://arxiv.org/abs/1711.01347

- Merging Cluster Collaboration: Optical and Spectroscopic Survey of a Radio-selected Sample of 29 Merging Galaxy Clusters:

Golovich, Dawson, Wittman, Jee, Benson, Lemaux, van Weeren, Andrade-Santos, Sobral, de Gasperin, Bruggen, Bradac, **Finner**, Peter

2017 Astrophysical Journal https://arxiv.org/abs/1710.02527

- MC²: Subaru and Hubble Space Telescope Weak-lensing Analysis of the Double Radio Relic Galaxy Cluster PLCK G287.0+32.9

Finner, Jee, Golovich, Wittman, Dawson, Gruen, Koekemoer, Lemaux, Seitz

OBSERVATIONS

2020B Subaru HSC PI (2hours)
Imaging of Bullet-like cluster.

2019A/B MMT/Hectospec – PI (2 nights)
Fiber observations to secure redshifts of cluster galaxies.

2019B Subaru Hypersuprime-Cam Co-I (4 hours)
Weak-lensing quality imaging of low-z merging galaxy clusters

2019 Cycle 37 GMRT Co-I (8 hours)
Band 5 observation of ZwCL J1447.2+2619

PRESENTATIONS

May 2020
Harvard-Smithsonian Center for Astrophysics, Cambridge, USA (Remote)

- Weak Lensing Characterization of Dark Matter Substructures in Radio Relic Merging Clusters

July 2019
Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, Italy

- Multiwavelength Reconstruction of the Merging Scenarios of Radio Relic Clusters

May 2019
LSST @ ASIA, Sydney, Australia

- Ongoing and Future Investigations of the Merging Scenarios of Galaxy Clusters

January 2019
EAO Subaru Science Workshop, Daejeon, South Korea

- MC²: Reconstructing the Merger Scenario for Massive Galaxy Clusters with Subaru Weak Lensing

August 2018
30th General Assembly of the IAU, Vienna, Austria
- Infrared Weak-Lensing Analysis of the Emerging Galaxy Cluster SPARCSJ1049+56 at z=1.7

October 2017
Diffuse Synchrotron Emission in Clusters of Galaxies, Leiden, The Netherlands
- A Weak-lensing Analysis of the Double Radio Relic Galaxy Cluster PLCKG287.0+32.9

October 2017
Korean Astronomy Society Fall Meeting, Yeosu, South Korea
- A Weak-lensing Analysis of the Double Radio Relic Galaxy Cluster PLCKG287.0+32.9

April 2017
Korean Astronomy Society Spring Meeting, Changwon, South Korea
- Where is the Dark Matter in the Double Radio Relic Galaxy Cluster PLCKG287.0+32.9?

January 2017
University of Victoria, Victoria, Canada
- The Dark Matter Distribution of the Merging Galaxy Cluster, PLCKG287.0+32.9, by Weak-lensing Analysis

January 2017
American Astronomy Society 229th Meeting, Grapevine, USA
- The Dark Matter Distribution of the Merging Galaxy Cluster, PLCKG287.0+32.9, by Weak-lensing

November 2016
Korean Institute for Advanced Study, Seoul, South Korea
- A Weak-lensing Analysis of the Merging Galaxy Cluster PLCKG287.0+32.9

April 2016
Korean Astronomy Society Spring Meeting, Busan, South Korea
- Introduction to weak-lensing theory and the surface mass distribution from weak lensing for PLCKG287.0+32.9

October 2015
SKA in Seoul, Seoul, South Korea
- Mapping the 3D Structure of the Virgo Cluster Filaments with the Tully-Fisher Relation

March 2015
UVic HonoursFest Poster Conference, Victoria, Canada
- Star Formation Rate Enhancements for Primary and Secondary Galaxies in Mergers

June 2014
RASC, Annual General Assembly, Victoria, Canada
- Search for White dwarf Eclipsing Exo-Planets, (SWEEP) at the DAO

AWARDS

2020 BK21 Prize for outstanding research paper
2019 Travel Grant to the LSST@Asia conference in Sydney, Australia
2016, 2017, 2018, 2019 Outstanding International Student Scholarship, Yonsei University
2017 BK21 Prize for Master's Thesis
2015 HonoursFest Top Presenter – Physics and Astronomy, University of Victoria
2013 Physics and Astronomy co-op thesis first place, University of Victoria
2012 Don Ingham Memorial Scholarship, University of Victoria
- Awarded to best student in 200 level courses of an Astronomy program

SKILLS AND KNOWLEDGE

Lab/Observation/Research
- Photometry with both IRAF and Source Extractor
- MMT Hectospec spectroscopy
- Imaging with the 0.8m UVic and the 1.8m Plaskett telescopes
- Radio observations with Korean VLBI Network
- Subaru (Hyper) Suprime-cam data reduction for weak-lensing analysis
- Hubble Space Telescope Optical/IR data reduction
- XMM Newton SAS and Chandra CIAO data reduction/analysis
- Extensive lab work using predictive calculations and comparing them to experimental results
- Quantitatively examine uncertainties and errors and propagate them to results
- Understand physical laws and principles and able to use analytical methods to examine the physical world
- Proficient at research using online, library, and collaborative sources

Computer
- Proficient with software/programs
  - IRAF, DS9, Source Extractor, SCAMP, SWarp, STIFF, MATLAB, COMSOL, Mathematica
- Competent in programming languages
  - Python, IDL, HTML, MySQL, JavaScript, Java, C++
- Knowledge of operating systems
  - Linux, Windows, DOS, OS X