Ramesh Mainali

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RESEARCH INTERESTS

Spectroscopy, galaxy formation and evolution, dwarf galaxies, emission line galaxies, gravitationally lensed galaxies, galactic outflows, ionizing photon escapes, stellar populations, high redshift galaxies, active galactic nuclei, metal poor galaxies, cosmic reionization.

EMPLOYMENT

JWST Postdoctoral Fellow **August, 2019-present**
NASA Goddard Space Flight Center, Greenbelt, MD, USA
The Catholic University of America, Washington, DC, USA
The Center for Research and Exploration in Space Science and Technology II (CRESST II)

Research Assistant **2013-2019**
The University of Arizona, Tucson, Arizona, USA

EDUCATION

PhD Astronomy & Astrophysics **2019**
The University of Arizona, Tucson, Arizona, USA
Thesis - "The rest-frame ultraviolet spectra of galaxies in the reionization-era"
Advisor: Dr. Daniel Stark.

MS Physics **2013**
Tribhuvan University, Kirtipur, Kathmandu, Nepal
Thesis - "Active Galactic Nuclei in Perseus Pisces cluster"
Advisor: Dr. Binil Aryal

OBSERVING EXPERIENCES

Magellan (6.5 m telescope): 25+ nights using FIRE, LDSS3 and IMACS.
Keck (10 m telescope): 2 nights using MOSFIRE.
LBT (8.4 m telescope): 10+ nights using LUCIFER & MODS.
MMT (6.5 m telescope): 10+ nights using MMIRS, BINOSPEC, Blue channel & Red channel spectrographs

OBSERVING PROPOSALS

As Principal Investigator

LBT/LUCIFER, "The nature of Luminous Galaxies in the Heart of the Reionization Era", 2 nights. 2016

As Co-Investigator

Magellan/FIRE, "Magellan/FIRE Spectroscopy of Metal Poor Galaxies: Toward an Understanding the Spectra of Reionization-Era Galaxies", 4 nights 2017-2018
MMT/Binospec, "Toward an Understanding of the Stellar Populations and Gas Conditions in Reionization-Era Galaxies", 2 nights 2018
MMT/MMIRS, "Understanding the Origin of High Ionization Nebular Lines in Young Galaxies at High Redshift", 2 nights 2017
Magellan/LDSS3, "Reionization with Lensing Clusters (RELICS): Spectroscopic followup of lensed galaxies", 4 nights 2016-2017
Keck/MOSFIRE, "The nature of Luminous Galaxies in the Heart of the Reionization", 2 nights 2016
HST/COS Cycle 23, "COS Views of He II Emitting Star Forming Galaxies: Preparing for the JWST Era", 20 orbits 2015
Magellan/FIRE, "Rest-UV Spectroscopy of Reionization-Era Galaxies", 17 nights 2014-2015
Keck/MOSFIRE, "Rest-UV Spectroscopy of Reionization-Era Galaxies", 2 nights 2014

HONORS AND AWARDS

- American Astronomical Society Rodger Doxsey Prize 2019
- Tribhuvan University merit scholarship 2011-2012

PUBLICATIONS

First Author Publications

1. "RELICS: Spectroscopy of gravitationally-lensed z$\simeq$2 reionization-era analogs and implications for CIII] detections at z>6",
R. Mainali, D. P. Stark, M. Tang et al., 2020, MNRAS, Volume 494, Issue 1, pp.719-735

2. "Spectroscopic constraints on UV metal line emission at z $\simeq$6-9: the nature of Lyα emitting galaxies in the reionization era",
R. Mainali, A. Zitrin, D. P. Stark, R. S. Ellis, J. Richard, M. Tang, N. Laporte, P. Oesch, I. D. McGreer, 2018, MNRAS, Volume 479, Issue 1, p.1180-1193.

3. "Evidence for a Hard Ionizing Spectrum from a z = 6.11 Stellar Population",
R. Mainali, J. A. Kollmeier, D. P. Stark,R. Simcoe, G. Walth, A. Newman, D. R. Miller, 2017, ApJL, Volume 836, Issue 1, article id. L14, 7.

4. "Ionized gas outflow from a Lyman continuum emitting galaxy at z$\sim$2.4: Implication for the role of feedback in ionizing photon escape",
R. Mainali, J. Rigby et al., in prep.

5. "Deep spectroscopy of CASSOWARY gravitationally-lensed galaxies: understanding the factors regulating UV metal line emission",
R. Mainali, D. P. Stark et al. in prep.

6. "Magellan spectroscopic survey of RELICS clusters: Redshift catalog of gravitationally lensed objects",
R. Mainali, D. P. Stark et al. in prep.

Co-author Publications

1. "RELICS: A Candidate z 6.8 Strong [OIII] emitter and Other Properties of z>5.5 Galaxies Inferred from Spitzer and Hubble Imaging",
V. Strait, M. Bradac et al. (including **R. Mainali**), 2020, eprint arXiv:2009.00020.

2. "RELICS: A Very Large ($\theta_E \sim 40$") Cluster Lens – RXC J0032.1+1808",
A. Acebron, A. Zitrin et al. (including **R. Mainali**), 2020, Volume 898, Issue 1, id.6

3. "The Reionization Lensing Cluster Survey (RELICS) and the Brightest High-z Galaxies,"
B. Salmon, D. Coe et al. (including **R. Mainali**), 2020, Volume 889, Issue 2, id.189, 18 pp

4. "RELICS: Reionization Lensing Cluster Survey",
   D. Coe, B. Salmon et al. (including **R. Mainali**), 2019, ApJ, Volume 884, Issue 1, article id. 85.
5. "RELICS: High-Resolution Constraints on the Inner Mass Distribution of the z=0.83 Merging Cluster RXJ0152.7-1357 from strong lensing,"
   A. Acebron, M. Alon et al. (including **R. Mainali**), 2019, Volume 874, Issue 2, article id. 132, 13 pp.
6. "RELICS: Strong Lensing Analysis of MACS J0417.5-1154 and Predictions for Observing the Magnified High-Redshift Universe with JWST,"
   G. Mahler, K. Sharon et al. (including **R. Mainali**), 2019, Volume 873, Issue 1, article id. 96, 15 pp.
7. "A bright-lensed galaxy at z = 5.4 with strong Lyα emission",
   I.D. McGreer, B. Clément, **R. Mainali** et al.,2018, MNRAS, Volume 479, Issue 1, p.435-453.
8. "Physical properties and H-ionizing-photon production rates of extreme nearby star-forming regions",
   J. Chevallard, S. Charlot, et al. (including **R. Mainali**), 2018, MNRAS, Volume 479, Issue 3, p.3264-3273.
9. "RELICS: Strong Lens Models for Five Galaxy Clusters from the Reionization Lensing Cluster Survey",
   C. Cerny, K. Sharon et al. (including **R. Mainali**), 2018, ApJ, Volume 859, Issue 2, article id. 159, 18 pp.
10. "RELICS: A Strong Lens Model for SPT-CLJ0615-5746, a z=0.972 Cluster",
    R. Paterno-Mahler, K. Sharon et al. (including **R. Mainali**), 2018, ApJ, Volume 863, Issue 2, article id. 154, 11 pp.
11. "RELICS: Strong-lensing Analysis of the Massive Clusters MACS J0308.9+2645 and PLCK G171.9-40.7",
    A. Acebron, N. Cibirka et al. (including **R. Mainali**), 2018, ApJ, Volume 858, Issue 1, article id. 42, 13 pp.
12. "RELICS: Strong Lensing analysis of the galaxy clusters Abell S295, Abell 697, MACS J0025.4-1222, and MACS J0159.8-0849",
    N. Cibirka, A. Acebron et al. (including **R. Mainali**), 2018, ApJ, Volume 863, Issue 2, article id. 145, 25 pp.
13. "A Candidate $z \sim 10$ Galaxy Strongly Lensed into a Spatially Resolved Arc",
    B. Salmon, D. Coe et al. (including **R. Mainali**), 2018, ApJL, Volume 864, Issue 1, article id. L22, 6 pp
14. "Ultraviolet spectra of extreme nearby star-forming regions - approaching a local reference sample for JWST",
    P. Senchyna, D. P. Stark, et al. (including **R. Mainali**),2017, MNRAS, Volume 472, Issue 3, p.2608-2632.
15. "A Spectroscopic Search for AGN Activity in the Reionization Era,"
    N. Laporte, K. Nakajima,et al. (including **R. Mainali**), 2017, ApJ, Volume 851, Issue 1, article id. 40, 10 pp.
16. "Lyα and C III] emission in z = 7-9 Galaxies: accelerated reionization around luminous star-forming systems?",
    D. P. Stark, R. S. Ellis, et al. (including **R. Mainali**), 2017, MNRAS, Volume 464, Issue 1, p.469-479.
17. "Spectroscopic detection of C IVλ1548 in a galaxy at z = 7.045: implications for the ionizing spectra of reionization-era galaxies",
    D. P. Stark, G. Walth,et al. (including **R. Mainali**), 2015, MNRAS, Volume 454, Issue 2, p.1393-1403.

PRESENTATIONS

1. **Contributed talk**, SAZERAC meeting, virtual, July, 2020
2. **Invited Colloquium**, Catholic University of America, January, 2020
2. **Department Seminar**, Tribhuvan University, Kathmandu, Nepal, May, 2018
1. **Dissertation talk**, AAS Meeting ,Seattle, WA, January, 2019
2. **Contributed talk**, Understanding Emission-line galaxies, Teruel, Spain, September, 2018
3. **Departmental seminar**, Tribhuvan University, Kathmandu, Nepal, May, 2018
4. **Contributed talk**, EWASS2018, Liverpool, United Kingdom, April, 2018
5. **Contributed talk**, The Snowbird Cosmic Lyman-Alpha Workshop, Utah, United States, March, 2017
6. **Contributed talk**, The Dawn of Galaxies 2017, Obergurgl, Austria, January, 2017
7. **Contributed talk**, RELICS team meeting, Tucson, Arizona, March, 2016
8. **Poster**, International Conference on Astrophysics and Cosmology, Kathmandu, Nepal, March, 2012

TEACHING EXPERIENCES

The University of Arizona
Teaching Assistant — Fall 2015, Fall 2016, Spring 2017

Om Secondary School, Bhaktapur, Nepal
Physics & Math teacher — 2005-2013

TECHNICAL SKILLS

- Programming: Python, IDL, Matlab.
- Data reductions: MosfireDRP (Keck/MOSFIRE), Firehose (Magellan/FIRE), Cosmos (Magellan/IMACS)

PROFESSIONAL SERVICES

- Journal referee: MNRAS & The Astrophysical Journal (ApJ)