

Neven Caplar

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Work experience

Sep 2022 - , Associate Director for LINCC Commissioning, DIRAC Institute, University of Washington

Group leaders: Dr. Mario Juric, Dr. Andy Connolly

0.5 FTE: Commissioning scripts and pipelines for LSST image differencing algorithms

0.5 FTE: Guiding the initial deployments, developing the use-cases and contributing to implementation of LSST Interdisciplinary network for collaboration and computing (LINCC) platforms

Sep 2017 - Aug 2022, Associate Professional Specialist, Princeton University

Group leaders: Dr. Robert Lupton, Dr. James Gunn, Dr. Michael Strauss

Algorithm and data reduction pipeline development for Prime Focus Spectrograph, with a focus on point spread function modeling

Education

Feb 2013 - Aug 2017, Ph.D., ETH Zurich

Advisor: Dr. Simon J. Lilly, ETH Zurich

Thesis title: Evolution of the AGN population in the Universe

Sep 2005 - Dec 2010, MSc, University of Zagreb

Advisor: Dr. Hrvoje Stefancic, Institut Ruder Boskovic

Thesis title: Unification models of dark energy and dark matter

Research

The main topics of my scientific work include time domain astronomy, methods for the analysis of large datasets, and AGN physics

First or corresponding author for papers in peer-reviewed journals

1. 2020, **N. Caplar**, T. Penna, S. Johnson, J. Greene
Nonstationarity of AGN variability: the only way to go is down!, *ApJL*, 2020, 889L, 29C
2. 2019, L. Sartori, K. Schawinski, B. Trakhtenbrot, **N. Caplar**, E. Treister, C. Zhang
A forward modelling approach to AGN variability – method description and early applications, *ApJ*, 2019, 883, 139S
3. 2019, **N. Caplar**, S. Tacchella
Stochastic modeling of star-formation histories I: the scatter of the star-forming main sequence, 2019, *MNRAS*, 487, 3845C
4. 2018, **N. Caplar**, S. Lilly, B. Trakhtenbrot
AGN evolution from galaxy evolution viewpoint - II, *ApJ*, 2018, 867, 148C
5. 2017, **N. Caplar**, S. J. Lilly, B. Trakhtenbrot
Optical variability of AGN in the PTF/iPTF survey, *ApJ*, 2017, 834, 111C

6. 2016, **N. Caplar**, S. Tacchella, S. Birrer
Quantitative evaluation of gender bias in astronomy, 2017, NatAs, 1E, 182C
7. 2015, **N. Caplar**, S. J. Lilly, B. Trakhtenbrot
AGN evolution from a galaxy evolution viewpoint, ApJ, 2015, 811, 148C
8. 2013, **N. Caplar**, H. Stefancic
Generalized models of unification of dark matter and dark energy, Phys. Rev. D, 2013, 87, 023510

Telescope Proposals

1. 2013, F. Miniati, S. J. Lilly, **N. Caplar**
The connection between magnetised galactic outflows and high Faraday effect in the circumgalactic environment of intermediate redshift galaxies;
Awarded 24 hours with VIMOS instrument on VLT
2. 2013, S. J. Lilly, F. Miniati, **N. Caplar**, B. Gaensler, J. Farnes
Testing the association of magnetized plasma with high redshift galaxies along the line of sight;
Awarded 5 nights at NTT telescope

Seminar and Conference Presentations

Seminars

2019: Harvard University / MPIA Garching / Laboratoire d'Astrophysique de Marseille
 2017: Weizmann Institute of Science / University of Geneva
 2016: Caltech / University of Washington / Stanford / University of Maryland
 2012: Karl-Franzens University / Jagellonian University

Selection of top 5 conference presentations

2018: New Directions in Optical/Near-IR Spectrographs and Wide-field Imagers, Princeton, USA
 2017: Unveiling the Physics Behind Extreme AGN Variability, St. Thomas, USA
 2015: Black Hole Accretion and AGN Feedback, Shanghai, PRC
 2015: Unveiling the AGN-Galaxy Evolution, Puerto Varas, Chile
 2014: Powerful AGN, Port Douglas, Australia

Teaching

Mentor for Summer research program and Junior semester project at Princeton University
 Summer 2019 and Spring 2018
 Assistan for various courses at ETH Zurich
 Fall 2016, Spring 2016, Fall 2015, Spring 2015, Fall 2014, Spring 2013, Fall 2013

Other relevant information

Reviewer for ApJ, MNRAS, Astronomy and Computing, Annals of Applied Statistics, eLife, National Research and Development Agency of Chile
 Programming Languages: Python, Wolfram Mathematica, CIAO, Zemax
 Experience in working with X-ray, optical and time-domain data
 Experience in data reduction, survey calibration, "big data" and machine learning techniques

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Full publication list

Peer-reviewed journals

1. 2022, C. Burke, Y. Shen, X. Liu, P. Natarajan, **N. Caplar**, J. Bellovary, Z. Wang
Dwarf AGNs from Variability for the Origins of Seeds (DAVOS): Intermediate-mass black hole demographics from optical synoptic surveys, submitted to MNRAS
<https://arxiv.org/abs/2207.04092>
2. 2021, A. Kovacevic, D. Ilic, L. Popovic, V. Radovic, I. Jankov, I. Yoon, **N. Caplar**, I. Cvorovic-Hajdinjak, S. Smic
On possible proxies of AGN light-curves cadence selection in future time domain surveys, MNRAS, 2021
doi.org/10.1093/mnras/stab1595
3. 2020, K. G. Iyer, S. Tacchella, S. Genel, C. C. Hayward, L. Hernquist, A. M. Brooks, **N. Caplar**, R. Dave, B. Diemer, J. C. Forbes, E. Gawsier, R. S. Somerville, T. K. Starkenburg
The Diversity and Variability of Star Formation Histories in Models of Galaxy Evolution, MNRAS, 2020
doi.org/10.1093/mnras/staa2150
4. 2020, S. Tacchella, J. C. Forbes **N. Caplar**
Stochastic modelling of star-formation histories II: star-formation variability from molecular clouds and gas inflow, MNRAS, 2020, 497, 698T
doi.org/10.1093/mnras/staa1838
5. 2020, I. Delvecchio, E. Daddi, J. Mullaney, E. Bernhard, L. Grimmer, R. Carraro, A. Cimatti, G. Zamorani, **N. Caplar**, D. Elbaz, G. Rodighiero
The evolving AGN duty cycle in galaxies since $z \sim 3$ as encoded in the X-ray luminosity function, ApJ, 2020, 892, 17D
doi.org/10.3847/1538-4357/ab789c
6. 2020, **N. Caplar**, T. Penna, S. Johnson, J. Greene
Nonstationarity of AGN variability: the only way to go is down!, ApJL, 2020, 889L, 29C
doi.org/10.3847/2041-8213/ab6a11
7. 2019, (*corresponding author*) L. Sartori, K. Schawinski, B. Trakhtenbrot, **N. Caplar**, E. Treister, C. Zhang
A forward modelling approach to AGN variability – method description and early applications, ApJ, 2019, 883, 139S
doi.org/10.3847/1538-4357/ab3c55

8. 2019, **N. Caplar**, S. Tacchella
Stochastic modeling of star-formation histories I: the scatter of the star-forming main sequence, 2019, MNRAS, 487, 3845C
doi.org/10.1093/mnras/stz1449
9. 2018, L. Sartori, K. Schawinski, B. Trakhtenbrot, **N. Caplar**, E. Treister, M. Koss, M. Urry, C. Zhang
A model for AGN variability on multiple time-scales, 2018, MNRAS, 476L, 34S
doi.org/10.1093/mnrasl/sly025
10. 2018, **N. Caplar**, S. Lilly, B. Trakhtenbrot
AGN evolution from galaxy evolution viewpoint - II, ApJ, 2018, 867, 148C
doi.org/10.3847/1538-4357/aae691
11. 2017, **N. Caplar**, S. J. Lilly, B. Trakhtenbrot
Optical variability of AGN in the PTF/iPTF survey, ApJ, 2017, 834, 111C
doi.org/10.3847/1538-4357/aae691
12. 2017, A. Weigel, K. Schawinski, **N. Caplar**, A. Carpineti, R. Hart, S. Kaviraj, W. Keel, S. Kruk, C. Lintott, R. Nichol, B. Simmons, R. Smethurst
Galaxy Zoo: Major galaxy mergers are not a significant quenching pathway, APJ, 2017, 845, 145W
doi.org/10.3847/1538-4357/aa8097
13. 2017, A. Weigel, K. Schawinski, **N. Caplar**, O. I. Wong, T. Ezequiel, B. Trakhtenbrot
AGN and their host galaxies in the local Universe: Two mass-independent Eddington ratio distribution functions characterize black hole growth, ApJ, 2017, 845, 134W
doi.org/10.3847/1538-4357/aa803b
14. 2016, **N. Caplar**, S. Tacchella, S. Birrer
Quantitative evaluation of gender bias in astronomy, 2017, NatAs, 1E, 182C
doi.org/10.1038/s41550-017-0141
15. 2015, **N. Caplar**, S. J. Lilly, B. Trakhtenbrot
AGN evolution from a galaxy evolution viewpoint, ApJ, 2015, 811, 148C
doi.org/10.1088/0004-637X/811/2/148
16. 2013, **N. Caplar**, H. Stefancic
Generalized models of unification of dark matter and dark energy, Phys. Rev. D, 2013, 87, 023510
doi.org/10.1103/PhysRevD.87.023510

Conference proceedings

1. 2018, T. Naoyuki, T. Naruhisa, A. Shimono, [and 111 others, including **N. Caplar**]
Prime Focus Spectrograph (PFS) for the Subaru telescope: ongoing integration and future plans, Proceedings of the SPIE, Volume 10702, id. 107021C 12 pp.
2. 2013, **N. Caplar**, M. Suznjevic, M. Matijasevic
Analysis of players' in-game performance vs rating: Case study of Heroes of Newerth, Foundation of Digital games 2013, pp. 237-244