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 physics of active galactic nuclei.
19 papers, 7 first-author papers, 5 conference proceedings, 790 citations

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

Assistant 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 data reduction, survey calibration, "big data" and machine learning techniques

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Full publication list

Peer-reviewed journals

1. 2022, A. B. Kovacevic, V. Radovic, I. Dragana, [and 22 others, including **N. Caplar**]
The LSST era of supermassive black holes accretion-disk reverberation mapping, APJS, 2022
doi:10.3847/1538-4365/ac88ce

2. 2022, K. G. Iyer, J. S. Speagle, **N. Caplar**, J. C. Forbes, E. Gawiser, J. Leja, S. Tacchella
Stochastic Modelling of Star Formation Histories III. Constraints from Physically-Motivated Gaussian Processes, Submitted to ApJ
https://arxiv.org/abs/2208.05938

3. 2022, K. Breivik, A. J. Connolly, K. E. S Ford, [and 94 others, including **N. Caplar**]
From Data to Software to Science with the Rubin Observatory LSST
https://arxiv.org/abs/2208.02781

4. 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, MNRAS, 2022
doi: 10.1093/mnras/stac2478

5. 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

6. 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

7. 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

8. 2020, I. Delvecchio, E. Daddi, J. Mullaney, E. Bernhard, L. Grimmett, 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

9. 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

10. 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

11. 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

12. 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

13. 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

14. 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

15. 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

16. 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

17. 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

18. 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

19. 2013, **N. Caplar**, H. Stefancic
Generalized models of unification of dark matter and dark energy, Phys. Rev. D, 2013, 87, 023510 doi.org/110.1103/PhysRevD.87.023510

Conference proceedings

1. 2022, **N. Caplar**, R. Lupton, J. E. Gunn, H. Siddiqui, P. Price, C. Loomis, A. L. Fur, J. E. Meyers
Prime focus spectrograph (PFS) for the Subaru Telescope: 2D modeling of the point spread function
Proc. SPIE 12184, Ground-based and Airborne Instrumentation for Astronomy IX, 1218470 (29 August 2022); doi.org/10.1117/12.2629364
2. 2022, Shian-Yu Wang, Masahiko Kimura, Chi-Huang Yan , [and 29 others, including **N. Caplar**]
Prime focus spectrograph (PFS) for the Subaru Telescope: the prime focus instrument
Proc. SPIE 12184, Ground-based and Airborne Instrumentation for Astronomy IX, 121846R (29 August 2022); doi.org/10.1117/12.2629098
3. 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.
4. 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