

Apurva V. OZA

POSTDOCTORATE RESEARCHER & LECTURER · [EXO]PLANETARY ATMOSPHERIC EVOLUTION

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“Qui ne tente rien n’a rien.”

Professional

Universität Bern

POSTDOCTORAL RESEARCHER/LECTURER

“Planets in Time” Group

Nov. 2017 - present

Indian Institute of Astrophysics & Raman Research Institute

VISITING LECTURER

Course: Intro to Planetary
Astrophysics

July 2019

Education

Sorbonne Universités VI: Pierre and Marie Curie University

PH.D ASTRONOMY & ASTROPHYSICS

- Thesis: Detection and Dynamics of Satellite Exospheres
- Advisor: Francois Leblanc; Co-advisor: Jean-Jacques Berthelier

Paris, FRANCE

Sep 28, 2017

University of Virginia Department of Astronomy

MASTER OF SCIENCE – ASTRONOMY

- Project: Atmospheric Evolution Modeling and Spectral Search for Tidally-Heated Exomoons.
- Advisor: Robert E. Johnson

Charlottesville, Virginia

Sep 2012- May 2014

University of North Carolina at Chapel Hill

B.S. PHYSICS & ASTRONOMY, *summa cum laude*

- Thesis: Modeling the Afterglow of GRB 091018A: Spectral Evolution and Evidence for a Progenitor-Driven Superwind.
- Advisor: Daniel E. Reichart

Chapel Hill, North Carolina

August 2008- May 2012

University of Toulouse III

L3, PHYSIQUE FONDAMENTALE ET M1 ASTROPHYSIQUE: (1-YR EXCHANGE STUDENT.)

Toulouse, France

Sep. 2010 - June 2011

North Carolina School of Science and Mathematics

Durham, North Carolina

Aug. 2006- May 2008

Students

Andrea Gebek

(advised)

University of Bern

UNDERGRADUATE THESIS: EVOLUTION OF ESCAPING EXOPLANETARY ATMOSPHERES IN SPACE AND TIME

October, 2018

Bjorn Cotting

(co-supervised)

University of Bern

UNDERGRADUATE THESIS: EVAPORATION OF TRAPPIST-1 PLANETS

March, 2018

Observational Programs

KECK/HIRES

Science PI

4 half nights

2019-2020

LBT/LMIRCAM	Co-I	<i>1 half-night</i> 2014
APO/ARCES	PI	<i>4 half-nights</i> 2013; 2014

TEACHING

July. 2019 Visiting Lecturer , Introduction to Planetary Astrophysics	<i>Indian Institute of Astrophysics; Raman Research Institute</i>
Jan. 2018 - present F.2018; F.2019 S.2018 Visiting Scientist: Indian Planetary Society , Lecturer: Planetary Formation & Evolution , with Professor Yann Alibert	<i>IPS-Rajkot University of Bern</i>
2012-2014 Instructor & Grader: Introductory Astronomy Courses , 320 Hours	<i>University of Bern UVA</i>
2013-2014 Developed new course: Astr 1221 Skynet Virginia , with Professor Edward Murphy	<i>UVA</i>
2013-2014 Developed new course: Astr 1270R: Physics of the Unsolved Mysteries of the Universe , with Professor Kelsey Johnson	<i>UVA</i>
2013, 2014 Instructor: Educational Research in Radio Astronomy (ERIRA) , Lead Polarization Project	<i>Green Bank, WV, USA</i>
2012 Guest Lecturer: Astr 1210, 1270 , Intro Astronomy & Unsolved Mysteries of the Universe	<i>UVA</i>
2011-2012 Teaching Assistant , Skynet Astronomy Labs	<i>UNC</i>

Honors & Awards

2016 2nd place presentation , National Solar & Terrestrial Conference (PNST)	<i>Hendaye, France</i>
2013, 2014 Hearst Fellowship in the Biological and Physical Sciences , \$6000	<i>Virginia, USA</i>
2012 Robert Shelton Award for Outstanding Research , UNC Department of Physics & Astronomy	<i>North Carolina, USA</i>
2009-2012 NASA Space Grant Research Fellowship , \$12,500	<i>North Carolina, USA</i>
2007 Best Undergraduate Poster , American Physical Society	<i>Tennessee, USA</i>

Education Public Outreach & Initiatives

2017 Finalist Science Magazine's , Dance Your PhD Competition.	<i>Paris, France</i>
2016 - Founder: CafeAstroParisien , Monthly Astronomy Discussions	<i>Paris, France</i>
2011-2014 Telescope Operator & Educator: Public Nights. , McCormick & Morehead Observatories.	<i>UVA & UNC</i>
2011-2012 Morehead Planetarium Educator , Carolina Skies Full Dome Theater Lectures	<i>North Carolina, USA</i>
2012-2014 Planetarium Educator , EPO Initiative: Dark Skies Bright Kids.	<i>Virginia USA</i>
2008-2012 Staff Writer , Carolina Scientific	<i>UNC</i>
2007 Mathematics Instructor , EPO Initiative: Akanksha	<i>Maharashtra, India</i>

PUBLICATIONS

14. **A.V. Oza** and C. Mordasini *Planet Evolution via Atmospheric Escape II A & A in prep*, 2019.
13. A.Gebek and **A.V. Oza** *Sodium and Potassium Signatures II: PROMETHEUS a Rapid Simulator for Escaping Alkaline Atmospheres* , ApJ, in prep, 2019.
12. **A.V. Oza** et al. *Sodium and Potassium Signatures of Volcanic Satellites Orbiting Close-in Gas Giant Exoplanets*, ApJ, accepted, 2019.
11. Bower et al. and **A.V. Oza** *Linking the evolution of terrestrial interiors and an early outgassed atmosphere to astrophysical observations* , A & A submitted, April 2019.
10. R.E. Johnson, **A.V. Oza** et al. The Origin and Fate of O₂ in Europa's Ice: An Atmospheric Perspective. Space Science Reviews, Mar. 2019.
9. **A.V. Oza**, F. Leblanc, R.E. Johnson, C. Schmidt, L. Leclercq, T.A. Cassidy, J.Y. Chaufray. Planetary and Space Science, 2019.
8. Stone, J. et al. 2018 including **A.V. Oza** The LEECH Exoplanet Imaging Survey: Limits on Planet Occurrence Rates Under Conservative Assumptions. Astronomical Journal, Oct. 2018.
7. **A.V. Oza**, R.E. Johnson, and F. Leblanc *Dusk/dawn atmospheric asymmetries on tidally-locked satellites: O₂ at Europa* Icarus Notes, May 2018.
6. F. Leblanc, **A.V. Oza**, L. Leclercq, C. Schmidt, T.A. Cassidy, R. Modolo, J.Y. Chaufray, R.E. Johnson. On the Orbital Variability of Ganymede's Atmosphere. Icarus *in press*, 2017.
5. Skemer et al. 2016 including **A.V. Oza**. The LEECH Exoplanet Imaging Survey: Characterization of the Coldest Directly Imaged Exoplanet, GJ 504 b, and Evidence for Superstellar Metallicity. The Astrophysical Journal, Volume 817, Issue 2, article id. 166, 10 pp.
4. R. E. Johnson, ; **Oza, A.V**; L. A. Young,; A. N. Volkov, ; C. Schmidt, Volatile Loss and Classification of Kuiper Belt Objects. The Astrophysical Journal, Volume 809, Issue 1, article id. 43, 9 pp. .
3. A.-L Maire et al. 2015 including **A.V.Oza**. The LEECH Exoplanet Imaging Survey. Further constraints on the planet architecture of the HR 8799 system .Astronomy Astrophysics Volume 576, id.A133, 10 pp.
2. Edward L. Wright, J. Davy Kirkpatrick, Christopher R. Gelino, Sergio Fajardo-Acosta, Gregory Mace, Peter R. Eisenhardt, Daniel Stern, Ian S. McLean, M. F. Skrutskie, **Apurva Oza**, M. J. Nelson, Michael C. Cushing, I. Neil Reid, Michele Fumagalli, Adam J. Burgasser. The First AllWISE Proper Motion Discovery: WISEA J070720.50+170532.7.The Astronomical Journal, 2014 Volume 147, Issue 3, article id. 61, 8 .
1. P. Petit, F. Lignières, M. Aurière, G.A. Wade, D. Alina, J. Ballot, T. Böhm, L. Jouve, **A. Oza**, F. Paletou, S. Théado. Detection of a weak surface magnetic field on Sirius A: are all tepid stars magnetic? Astronomy & Astrophysics, 2011 Volume 532, id.L13..

CONFERENCE PROCEEDINGS & SELECTED PRESENTATIONS

46. **A.V.Oza** et al. 2019. Planetary Evolution Driven by Atmospheric Escape: Sub-Neptune to Super-Earth Transition over a Range of Stellar Types (Talk). DPS/EPSC, Geneva (Sep. 2019)
45. **A.V.Oza** et al. 2019. Extrasolar Volcanic Activity on the Magmatic Super Earth 55 Cancri-e (Poster). DPS/EPSC, Geneva (Sep. 2019)
44. A. Gebek & **A.V. Oza**. Nonhydrostatic Density Profiles of Sodium & Potassium at Close-in Gas Giant Exoplanets (Talk) DPS/EPSC, Geneva (Sep. 2019)
43. Leblanc, F et al. 2019 including **A.V.Oza**. Modelling of Europa's Plume (Poster). DPS/EPSC, Geneva (Sep. 2019)
42. Gamborino, D. et al. 2019 including **A.V.Oza** Silicate Atmospheres: A study of proto-Mercury (Poster). DPS/EPSC, Geneva (Sep. 2019)
41. Bower, D. et al. 2019 including **A.V.Oza** Linking the evolution of terrestrial interiors and an early outgassed atmosphere to astrophysical observations (Poster). DPS/EPSC, Geneva (Sep. 2019)
40. Galli, A. et al. 2019 including **A.V.Oza** Laboratory analogues for the icy moons of Jupiter – The added value of a time-of-flight mass spectrometer (Poster). DPS/EPSC, Geneva (Sep. 2019)
39. R.E. Johnson & **A.V.** Sodium Signatures of Satellites Orbiting Close-in Gas Giant Exoplanets (Solicited Talk). DPS/EPSC, Geneva (Sep. 2019)
38. E. Bolmont, **A.V.Oza**, et al. 2019. Survival of satellites during the migration of a Hot Jupiter: the influence of tides (Talk). DPS/EPSC, Geneva (Sep. 2019)
37. R.E. Johnson & **A.V.** Sodium Signatures of Satellites Orbiting Close-in Gas Giant Exoplanets (Solicited Talk). DPS/EPSC, Geneva (Sep. 2019)
36. **A.V.Oza** et al. 2019. Alkaline Signatures of Active Exomoons (Poster). Extreme Solar Systems IV, Reykjavik, Iceland.
35. **A.V.Oza** & C. Dorn et al. 2019 . A New Class of Super-Earths (Talk). Extreme Solar Systems IV, Reykjavik, Iceland.
34. **Oza, A.V.** et al. 2019. Rocky Exomoon Signatures Hidden in the Spectra of Close-in Gas Giant Exoplanets. (Invited Talk) Indian Institute of Astrophysics, Seminar, Bangalore, India.
33. **Oza, A.V.** et al. 2019. Illuminating the Magnetospheres of Close-in Giant Exoplanets: Metallic Signatures of Volcanic Exomoons. (Invited Talk) Raman Research Institute, Bangalore, India.
32. **Oza, A.V.** et al. 2018. Na & K at Close-in Exoplanets: Evidence for Geologically-Active Satellites? (Talk) New York University, New York, USA.
31. **Oza, A.V.** et al. 2018. O₂ Outgassing at Icy Satellites and Comets. (Talk) American Astronomical Society, DPS meeting 50, id.403.03
30. **Oza, A.V.** et al. 2018. Exogenic Volatiles in the Extended Exospheres of Extrasolar Giant Planets. (Talk) European Planetary Science Congress, Berlin, Germany.
29. **Oza, A.V.** et al. 2018. Distinguishing Exogenic and Endogenic Volatiles in Extrasolar Giant Planet Exospheres. (Invited Talk) NASA Goddard, Maryland.
28. **Oza, A.V.** et al. 2018. Volcanic Extrasolar Satellite Signatures. (Invited Talk) Observatory of Geneva, Switzerland.
27. Galli, A. et al. 2018 including **Oza, A.V.** Simulating the plasma - ice interaction in the lab for Jupiter's icy moons 20th EGU General Assembly, EGU2018, Proceedings from the conference held 4-13 April, 2018 in Vienna, Austria, p.4802
26. **Oza, A.V.**. Outgassing Ocean Worlds. (Invited Talk) Indian Space Research Organization (ISRO), PRL, Ahmedabad, India, Jan. 2018.
25. **Oza, A.V.** et al. 2017. Atmospheric Bulges on Tidally-Locked Satellites. (Talk) American Astronomical Society, DPS meeting 49, id.203.12
24. **Oza, A.V.** et al. 2017. Rotation-Driven Icy Galilean Satellite Exospheres. (Invited Talk) Center for Space and Habitability. Bern, Switzerland
23. **Oza, A.V.** et al. 2017. Les Bosses Atmosphériques. (Invited Talk) LESIA. Meudon, France.

22. **Oza, A.V.** et al. 2017. Europa and Ganymede's Water-Product Exospheres. (Poster) European Planetary Science Congress 2017, held 17-22 September, 2017 in Riga Latvia, id. EPSC2017-626
21. **Oza, A.V.** et al. 2017. Rotation-Driven Icy Galilean Satellite Exospheres. (Talk) Ices in the Solar System. ESA-AC. Madrid, Spain.
20. **Oza, A.V et al. 2016** Directly Detecting Molecular Oxygen Exospheres at Europa and Ganymede. (Poster). Canary Islands Winter School of Astrophysics
19. **Oza, A.V et al. 2016** Origin and Evolution of Europa's Oxygen Exosphere. (Talk). AAS/Division for Planetary Sciences Meeting Abstracts, Vol. 48, 517.05.
18. **Oza, A.V et al. 2016** On the Direct Detection of Water Exospheres at Europa and Ganymede. (Poster). CNES Toulouse, France. 2016
17. Leblanc, F., **Oza, A.V** et al. 2016 3D Multispecies Collisional Model of Ganymede's Atmosphere. (Poster). AAS/Division for Planetary Sciences Meeting Abstracts, Vol. 48, 429.09.
16. **Oza, A.V. et al. 2016** "Development of a Carbon Nanotube Ionizer for Exosphere Exploration." (Poster). Programme Nationale Soleil-Terre. Hendaye, France.
15. **Oza, A.V. et al. 2016** Capturing Atmospheres via Nanotechnology and 3D Exosphere Simulations. (Talk). ESEP: Space Instrumentation for planetary exploration. Observatoire de Paris, Meudon, France.
14. **Oza, A.V. et al. 2015** Towards a Carbon Nanotube Ionization Source for Planetary Atmosphere Exploration. (Poster). AGU Fall Meeting. San Francisco, California
13. **Oza, A.V. et al. 2015** "Carbon Nanotube Ionization Source for Planetary Atmosphere Exploration." (Talk). Institut d'Astrophysique de Paris. Paris, France.
12. Schmidt, C. et al. 2015 including **A.V.Oza** Plasma Parameters in Io's Torus II: Measurements from Apache Point Observatory. European Planetary Science Congress 2015. Nantes, France.
11. Troup, N. et al. 2015 including **A.V.Oza** A Study of Statistical Binaries with SDSS/APOGEE. American Astronomical Society, AAS Meeting 225, id.340.06.
10. **Oza, A.V. et al. 2014** "Exploration of Planetary Atmospheres : Simulation and Detection." (Talk). Institut d'Astrophysique de Paris. Paris, France.
9. Johnson, R.E.,**Oza, A.V** et al. 2014 Volatile Loss and Classification of Kuiper Belt Objects. American Astronomical Society, DPS meeting 46, id.510.01.
8. Skemer, A. et al. 2014 including **A.V.Oza** High contrast imaging at the LBT: the LEECH exoplanet imaging survey. Proceedings of the SPIE, Volume 9148, id. 91480L 12 pp. (2014). (SPIE Homepage)
7. Turner, J. et al. 2014 including **A.V.Oza** Plasma Parameters in Io's Torus I: Measurements from Apache Point Observatory. American Geophysical Union, Fall Meeting 2014, abstract P13E-07.
6. LEECH: A 100 Night Exoplanet Imaging Survey at the LBT
Andrew Skemer, and 31 co-authors, including **A.Oza**. " Exploring the Formation and Evolution of Planetary Systems, " *Proceedings of the International Astronomical Union*, IAU Symposium, Volume 299, pp. 70-71, January 2014.
5. Probing the Circumburst Environment & Jet of GRB 091018A : Modeling the Synchrotron Peak - Cooling Break Cross Over. **Oza, A**, Reichart D, Trotter, A. *American Astronomical Society* meeting. Austin, TX, January 8-12, 2012.
4. Weak magnetic fields of intermediate-mass stars
P. Petit, F. Lignières, G.A. Wade, M. Aurière, D. Alina, T. Böhm, **A. Oza**.
Astronomische Nachrichten, Vol.332, Issue 9/10, p.943, December 2011.
3. **Oza, A.** *Afterglow Photometry and Modeling GRB 091018*. American Physical Society, 78th Annual Meeting of the Southeastern Section of the APS; October 19-22, 2011; Roanoke, VA.

2. **Oza et al.** *First Detection of Polarization in the North Polar Spur with the NRAO 40 ft. telescope.* Educational Research in Radio Astronomy, July 2010, Green Bank, WV.
1. **Oza, A.** *Exploring the Relationships of Optical Blazar and Quasar Variability Through a Range of Redshifts.* Annual Meeting of the Southeastern Section of the APS, December 2007.

POPULAR SCIENCE ARTICLES & CIRCULARS

4. Co-author on 55 Gamma-Ray Burst Coordination Network (GCN) Circulars. 2009-2013
3. Oza, A.V. "A Magnetizing Find." *Carolina Scientific* 4.1 (2011): 4-5.
2. Oza, A.V. "An Astronomical Kingdom." *Carolina Scientific* 3.2 (2011): 13-14.
1. Oza, A.V. "A Superbubble Bath." *Carolina Scientific* 2.1 (2009): 32-33.