

Nathan Brunetti – Curriculum Vitae

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Education:

Mar. 2022 **McMaster University**, Hamilton, ON
PhD in Astrophysics
Thesis advised by Christine D. Wilson: “Cloud-scale molecular gas properties in nearby merging galaxies”

Oct. 2017 **McMaster University**, Hamilton, ON
MSc in Astrophysics
Thesis advised by Christine D. Wilson: “An ALMA Archival Survey of the Clump Mass Function in the Large Magellanic Cloud”

May 2013 **University of Massachusetts**, Amherst, MA
Honors BSc in Astronomy
Honors Capstone Thesis advised by Grant Wilson: “Translation and Optimization of the AzTEC Source Finding and Map Completeness Simulation Algorithms from IDL to C++”

Professional Experience:

Apr. 2022 – Present Research Assistant (McMaster Physics & Astronomy Department)

Aug. – Dec. 2020 Beta Tester – ARCADE Data Reduction Platform (ALMA Development Study)

Jun. – Dec. 2019 Data Science Intern – NTCO-CREATE (Miovision)

Nov. 2019 Attendee – Goal Setting, Time Management, and Stress Reduction Workshop (Okanagan College)

Apr. 2019 Co-Organizer – ALMA Community Day

Dec. 2017 Attendee – MITACS Foundations of Project Management I Workshop

Jul. 2017 Attendee – Dunlap Institute Instrumentation Summer School

2013 – 2015 Scientific Associate III: Data Analyst (NRAO)

Mar. 2015 Instructor – ALMA Community Day

May 2014 Attendee and Tutor – NRAO Synthesis Imaging Summer School

Summer 2012 NSF Summer Research Assistant (NRAO Charlottesville)

Observing Experience:

2017 (1 week) Submillimeter Array (SMA)

Approved Observing Proposals As PI:

Cycle 4

Atacama Large Millimeter/submillimeter Array (ALMA)

Honors and Awards:

2018 – 2019	McMaster International Excellence Award
2016 – 2017	McMaster International Excellence Award
2009 – 2013	Commonwealth Honors College
2009 – 2013	Dean's List Honors
2009 – 2013	Dean's Scholarship
2009 – 2013	John and Abigail Adams Scholarship

Software and Coding:

Python	NRAO/ALMA Data Analysis Utilities Machine Learning Analysis of Vehicle Traffic Data with scikit-learn
CASA	ALMA Data Reduction and General User Support
IDL	Spectral Data Analysis in GBTIDL Writing Data Reduction Graphical Interface for UMass AzTEC Instrument JCMT Spectral Data Analysis as NRAO Summer Research Assistant
C/C++	McMaster Scientific Computing Teaching Assistant (Physics 2G03) Porting AzTEC Reduction Pipeline from IDL
SQL	Vehicle Traffic Data Retrieval and Analysis
Git	Data Processing and Analysis Scripts Authoring Journal Articles Research-Group Documentation

Outreach:

May 2021	Merit Judge – Bay Area Science and Engineering Fair
Feb 2021	Co-Organizer – Intro to Python for Second-Year Physics Undergraduates Workshop (McMaster)
May 2020	Merit Judge – Bay Area Science and Engineering Fair
Sep. 2019	Invited Speaker – L3 Harris WESCAM Astronomy Night
2017 – 2021	Manager – Sidewalk Astronomy (McMaster)
2016 – 2020	Presenter – McCallion Planetarium
2015 – 2021	Volunteer – Sidewalk Astronomy (McMaster)
Mar. 2015	Judge – Virginia Piedmont Regional Science Fair
Aug. 2013, 2014	Volunteer – Dark Skies, Bright Kids! Star Party (University of Virginia)

Presentations:

May 2020	iPoster – Canadian Astronomical Society Annual Meeting
Nov. 2019	Talk – NTCO-CREATE Annual Meeting
Sep. 2019	Poster – Views on the Interstellar Medium in Galaxies in the ALMA Era Conference

Presentations (continued):

Apr. 2019	Talk – ALMA Community Day Introduction to Interferometry
Nov. 2018	Poster – NTCO-CREATE Annual Meeting
July 2018	Poster – The Laws of Star Formation: From the Cosmic Dawn to the Present Universe Conference
Feb. 2018	Talk – TUNA Lunch (NRAO/University of Virginia)
Dec. 2017	Poster – NTCO-CREATE Annual Meeting
May 2017	Poster – Canadian Astronomical Society Annual Meeting
Sep. 2016	Poster – Half a Decade of ALMA: Cosmic Dawns Transformed Conference
Jun. 2016	Poster – 11 th Great Lakes Cosmology Workshop
May 2016	Poster – Canadian Astronomical Society Annual Meeting
Jan. 2013	Poster – 221 st American Astronomical Society Annual Meeting

Publications:

6. “Extreme giant molecular clouds in the luminous infrared galaxy NGC 3256,” **Brunetti**, Wilson, *Monthly Notices of the Royal Astronomical Society*, submitted.
5. “Embedded Young Massive Star Clusters in the Antennae Merger,” He, Wilson, **Brunetti**, Finn, Bemis, Johnson, *The Astrophysical Journal*, 928, 57, 2022.
4. “Highly turbulent gas on GMC scales in NGC 3256, the nearest luminous infrared galaxy,” **Brunetti**, Wilson, Sliwa, Schinnerer, Aalto, Peck, *Monthly Notices of the Royal Astronomical Society*, 500, 4730, 2021.
3. “The Kennicutt-Schmidt Law and Gas Scale Height in Luminous and Ultraluminous Infrared Galaxies,” Wilson, Elmegreen, Bemis, **Brunetti**, *The Astrophysical Journal*, 882, 5, 2019.
2. “An ALMA archival study of the clump mass function in the Large Magellanic Cloud,” **Brunetti**, Wilson, *Monthly Notices of the Royal Astronomical Society*, 483, 1624, 2019.
1. “Correlating Infall with Deuterium Fractionation in Dense Cores,” Schnee, **Brunetti**, Di Francesco, Caselli, Friesen, Johnstone, Pon, *The Astrophysical Journal*, 777, 121, 2013.