

DR. NICOLE KARNATH

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RESEARCH INTERESTS

Protostellar formation and evolution, disk formation and evolution, outflows, magnetic fields, multiplicity, environmental influence on protostellar formation, dust polarization and grain chemistry, cluster dynamics and dispersal

EMPLOYMENT

Lead FORCAST Instrument Scientist, SOFIA	May 2020 - Present
FORCAST Instrument Scientist, SOFIA	August 2019 - May 2020
Research Assistant, University of Toledo	2016 - 2019
Teaching Assistant, University of Toledo	August 2013 - 2015
Research Assistant, Lowell Observatory	Summer 2012 & 2013
Teaching Assistant, Northern Arizona University	August - May 2011 & 2012

EDUCATION

University of Toledo	July 2019
• Advisor: Tom Megeath	Toledo, OH
• Dissertation: The Transition Points in Stars and Star Clusters	
Northern Arizona University	May 2013
• Advisor: Lisa Prato	Flagstaff, AZ
• Thesis: Orbital Parameters for Two Young Spectroscopic Binaries	
Ohio State University	June 2011
• Advisor: Donald Terndrup	Columbus, OH

PUBLICATIONS

Karnath, N., Megeath, S. T., Tobin, J. J., Stutz, A. M., et al. (Including others) 2020, ApJ, 890, 129K - Detection of Irregular, Submillimeter Opaque Structures in the Orion Molecular Clouds: Protostars within 10,000 yr of Formation?

Tobin, J. J., Sheehan, P. D., Megeath, S. T., et al. (**including Karnath, N.**), ApJ, 890, 130T - The VLA/ALMA Nascent Disk and Multiplicity (VANDAM) Survey of Orion Protostars. II. A Statistical Characterization of Class 0 and Class I Protostellar Disks

Karnath, N., Prchlik, J. J., Gutermuth, R. A., Allen, T. S. et al. (including others) 2019, ApJ, 871, 46K - The Dynamics, Structure, and Fate of a Young Cluster During Gas Dispersal: Hectoschelle, Chandra, and Spitzer Observations of Cep OB3b

Tobin, J. J., Megeath, S. T., van't Hoff, M., et al. (**including Karnath, N.**), 2019, ApJ, 886, 6T - The VLA/ALMA Nascent Disk and Multiplicity (VANDAM) Survey of Orion Protostars. I. Identifying and Characterizing the Protostellar Content of the OMC-2 FIR4 and OMC-2 FIR3 Regions

Karnath, N., Prato, L., Wasserman, L H., et al. 2013, AJ, 146, 149 - Orbital Parameters for the Two Young Binaries VSB 111 and VSB 126

Simon, M., Schaefer, G. H., Prato, L., Ruiz-Rodriguez, D., **Karnath, N.**, Franz, O. G. & Wasserman, L. H., 2013, ApJ, 773, 28 - Masses and Distance of the Young Binary NTTS 045251+3016

Hinkle, K. H., Lebzelter, T., Fekel, F. C., Straniero, O., Joyce, R. R., **Karnath, N.**, Prato, L., & Habel, N., 2020, ApJ (submitted) - The M Supergiant High Mass X-Ray Binary 4U 1954+31

Karnath, N., Megeath, S. T., Fischer, W., et al. (in prep) - Six Intermediate Mass Protostars via FORCAST and IGRINS

Karnath, N., Prato, L., Simon, M., Bender, C., Wasserman, L. H., & Biddle, L. I., et al. (in prep) - H-band Spectra of Radial Velocity Standards from NIRSPEC

Karnath, N., Megeath, S. T., Furlan, E., et al. (in prep) - IGRINS and iSHELL Spectroscopy of Orion Protostars: Constraining Temperatures and Radii of Flat-Spectrum Protostars

Megeath, S. T., Watson, D. W., Puravankara, M., et al. (**including Karnath, N.**), (in prep) - GREAT reveals the complex nature of the HOPS 370 outflow

FUNDING AWARDS

SOFIA Telescope	2019 - present
P1 Ranked HAWC+ proposal of the Youngest Protostars in Orion	\$38,200.00
AAS International Travel Grant	2018
Travel for EPoS 2018 Meeting	\$1568.51
NRAO Student Observing Support Program	2016
Support as a student working on NRAO data	\$36,552.18

OBSERVING EXPERIENCE AND TIME AWARDED

P.I.: SOFIA/HST	2020 - present
upGREAT and HAWC+ on SOFIA and WFC3 on HST	12 hours SOFIA & 10 hours HST
P.I.: SOFIA HAWC+	2019 - present
Magnetic Fields of the Youngest Protostars in the Orion Molecular Clouds	4 hours
Instrument Scientist for SOFIA FORCAST Observations	8 flights Oct 2019
P.I.: Lowell Discovery Telescope	2016 - 2019
Determining the Birth Environment Conditions on Young Stars	120 hours
P.I.: NASA Infrared Telescope Facility	2016 - 2018
iSHELL Spectroscopy of Orion Protostars	115 hours
P.I.: Gemini North Telescope	2017
GNIRS Spectroscopy of Orion Protostars	8.4 hours
1.0-m Ritter Observatory Telescope	2014 -2015
Student Observing Team	University of Toledo, OH
2.7-m Harlan J. Smith Telescope	November 2012
Observing run with Dr. Lisa Prato	McDonald Observatory, TX
1.3-m McGraw-Hill Telescope	October 2010
Observing run with Dr. Donald Terndrup	Kitt Peak National Observatory, AZ
2.4-m Hiltner Telescope	February 2010
Observing run with Dr. Donald Terndrup	Kitt Peak National Observatory, AZ

PRESENTATIONS

- Contributed Talk: Universidad de Concepcion** **July 2020**
The Youngest Protostars in the Orion Molecular Clouds: Implications
for Our Current Understanding of Star Formation Remote
- Dissertation Talk: AAS Meeting, #235** **January 2020**
Three Transition Points in the Formation of Young Stars and Star Clusters Honolulu, HI
- Contributed Talk: APS Ohio-Region Section Fall Meeting** **September 2018**
The Youngest Protostars in the Orion Molecular Cloud:
Observations Revealing the Physics of Protostar Formation Toledo, OH
- Poster: The Early Phase of Star Formation 2018** **May 2018**
Candidate Protostars within 10 kysr of Hydrostatic Core Formation Ringberg Castle, Germany
- Contributed Talk: Star and Planet Formation in the Southwest 2** **March 2018**
An ALMA+VLA Survey of Orion Protostars: The Youngest Class 0 Objects Oracle, AZ
- Astronomy Seminar: University of Oklahoma** **February 2018**
Cep OB3b: An Expanding, Older ONC-like Cluster Norman, OK
- Poster: Women in Astronomy IV** **June 2017**
The Orion VLA/ALMA Nascent Disk and Multiplicity Survey Austin, TX
- Contributed Talk: AAS Meeting, # 230** **June 2017**
The VLA/ALMA Nascent Disk and Multiplicity Survey of Orion Austin, TX
- Contributed Talk: Star Clusters: From Infancy to Teenagehood** **August 2016**
Cep OB3b: An Expanding, Older ONC-like Cluster Heidelberg, Germany
- Poster: AAS Meeting, #227** **January 2016**
A Hectochelle Radial Velocity Survey of Cep OB3b: An ONC-like Cluster
at Late Gas Dispersal Phase Austin, TX
- Poster: Circumstellar Disks and Planet Formation Conference** **October 2014**
Disk Studies and Properties of Cep OB3b Members Ann Arbor, MI
- Poster: AAS Meeting, # 219** **January 2013**
Orbital Parameters for Two PMS Spectroscopic Binary Systems Long Beach, CA
- Poster: AAS Meeting, # 219** **January 2011**
Angular Momentum Loss in Subdwarf B + dwarf M Binaries Seattle, WA
- Poster: AAS Meeting, # 217** **January 2011**
Orbital Parameters for a PMS Spectroscopic Binary Seattle, WA

OUTREACH AND VOLUNTEERING

12th Annual Conference for Undergraduate Women in Physics Committee Organizing Member: Fundraising Officer University of Toledo Site	January 2018
LDT TAC at University of Toledo	September 2015 -2016
Public Talk at Sunset Village in Sylvania, OH	October 2016
Science Day at Ottawa Hill Elementary School in Ottawa Hills, OH	May 2016
Lowell Observatory Board of Trustees Talk	June 2013

INSTRUCTIONAL EXPERIENCE

Guest Lecturer: Physics 1910 Frontier in Physics and Astronomy University of Toledo	October 2017
Guest Lecturer: Astronomy 1010 University of Toledo	October 2014
Teaching Assistant: Astronomy 2050 Labs University of Toledo	August 2013 - December 2015
Teaching Assistant: Physics Labs Northern Arizona University	August 2011 - May 2013

WORKSHOPS

CHARA Workshop, Toledo, OH	September 2017
SOFIA Workshop, Ann Arbor, MI	May 2017
ALMA/VLA/VLBA Workshop, Ann Arbor, MI	March 2017
5th VLA Data Reduction Workshop, Socorro, NM	March 2016

MEMBERSHIP

Member of the American Astronomical Society
APS
Society of Physics Students

Sigma Pi Sigma

LANGUAGES AND PROGRAMS

IDL

Python

Latex

Microsoft Office: Word and Excel

CASA

REDSPEC

IRAF