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Educational Background:

- 2013 PhD Astrophysics University of Colorado, Boulder
- 2009 M.S. Astrophysics University of Colorado, Boulder
- 2006 B.S. Astrophysics Rice University

Professional Employment:

- 2013 - present Fellow European Southern Observatory
Garching, Germany
- 2007 - 2013 Graduate Research Assistant Center for Astrophysics and Space Astronomy,
University of Colorado, Boulder, CO
- 2010 - 2013 Instructor Department of Astrophysical and Planetary Sciences,
University of Colorado, Boulder, CO
- 2007 - 2011 Teaching Assistant Department of Astrophysical and Planetary Sciences,
University of Colorado, Boulder, CO
- 2007 Research Assistant Department of Physics and Astronomy,
University of Denver, Denver, CO

Areas of Research:

- The astrophysics of massive star formation and the interstellar medium, with a focus on observations of proto-cluster clumps, massive outflows, and turbulence.
- Observing with single-dish heterodyne and continuum millimeter instruments, single dish and synthesis array radio imaging, and optical and near infrared imaging and spectroscopy.
- The development of software tools for the analysis and visualization of diffuse and extended emission, spectral data cubes, and large astronomical data sets.

Honors/Awards:

- 2013 European Southern Observatory Postdoctoral Fellowship
- 2011 University of Colorado Chance Irick Cooke Fellowship for Excellence in Research
- 2010 NRAO Green Bank Student Observing Support
- 2010 NSF GRFP Honorable Mention
- 2009 NSF GRFP Honorable Mention
- 2008 NSF GRFP Honorable Mention
- 2008 NRAO Photo Contest First Prize
- 2008 University of Colorado Astrophysical and Planetary Sciences Excellence in Teaching award
- 2006 National Radio Astronomy Observatory - summer REU with David Meiers

Academic Advising:

Date	Program	Student	Project
Fall 2013 - present	Ludwig-Maximilian University / ESO PhD Thesis Student	Anna Faye McLeod	FUSION: Comparison of hydrodynamic simulations and observations in nearby high mass star forming regions
Summer 2014	Google Summer of Code	Simon Liedtke	New tools for astroquery : XMatch, SkyView, Atomic Line List
Summer 2013	Google Summer of Code	Madhura Parikh	A coherent API for astroquery , a python web database query toolkit

Teaching:

Date	Course
• Spring 2013	Instructor of ASTR 2600: Introduction to Programming for Astronomers (in IDL)
• Fall 2012	Instructor of ASTR 2600: Introduction to Programming for Astronomers (in IDL)
• Summer 2010	Co-Instructor of ASTR 1020: Stars and Galaxies
• Fall 2011	Co-Instructor of ASTR 6000: Graduate Seminar on the Interstellar Medium
• Fall 2011	Teaching Assistant for ASTR 3510: Astronomical Observing (imaging)
• Spring 2010	Teaching Assistant for ASTR 3520: Astronomical Observing (spectroscopy)
• Fall 2009	Teaching Assistant for ASTR 3510: Astronomical Observing (imaging)
• Fall 2008	Teaching Assistant for ASTR 3520: Astronomical Observing (spectroscopy)
• Spring 2008	Teaching Assistant for ASTR 3510: Astronomical Observing (imaging)
• Fall 2007	Teaching Assistant for ASTR 3520: Astronomical Observing (spectroscopy)

Conferences and Workshops:

Date	Meeting Name	Role	Talk or Poster Title
2015	Florence Simulation-Observation Workshop	Organized	CAMELOT: Comparing simulations and observations
2015	ESO Central Molecular Zone workshop (2 days)	Organized	Dense Gas Structure and Thermal Balance in the CMZ
2015	Astropy Lorentz Center Workshop (5 days)	Talks & unconferences	radio-astro-tools, astroquery, and spectral-cube
2015	University of Munich Filaments Workshop (3 days)	Talk	W51: The most active star-forming complex in the Galaxy
2015	Soul of High Mass Star Formation, Chile	Talk	The Density Structure of the W51 GMC
2014	Workshop on the APEX CMZ 1 mm survey at MPIfR Bonn (1 day)	Organized	
2014	ALMA Arc Node Retreat	Talk	ALMA's first look at the extended Sgr B2 Cloud
2014	Sexten Workshop: The Formation of Globular Clusters	Talk	The Galactic population of young massive clusters
2014	Sexten Workshop: The assembly of massive clusters	Talk	The density of W51 and its protoclusters
2014	Early Phase of Star Formation (EPoS 6)	Talk	The density structure of The Brick
2014	Early Phase of Star Formation (EPoS 6)	Poster	The density structure of the W51 Giant Molecular Cloud
2013	ISM Physical Processes in Garching	Poster	A measurement of the turbulence driving parameter
2013	.Astronomy 5	Talk	Astroquery: A toolkit for remote data access in python
2013	AAS 221	Thesis Talk	Surveying massive star formation in the Galactic Plane
2012	Galactic Scale Star Formation	Poster	There are no starless massive proto-clusters in the first quadrant
2012	Labyrinth of Star Formation	Talk	Surveying Pre-Stellar Gas with the BGPS (with an emphasis on what we don't see)
2011	Milky Way	Talk	The Bolocam Galactic Plane Survey
2010	Stars to Galaxies	Poster	Star Formation in Perseus Arm Complexes
2010	AAS 217	Poster	Formaldehyde Densitometry of Dust Clumps: The shapes and densities of massive star forming regions
2009	AAS 215	Poster	The Bolocam Galactic Plane Survey: Data, Early Results, and Future Directions

Successful Observing Proposals to open TACs as PI:

Telescope	Title	Time	Status
VLA 2014	VLA15A-164: Studying turbulence through the atomic-to-molecular transition	3.3 hours	Approved
GBT 2014	GBT14A-329: MUSTANG Galactic Plane survey: HCHIs in the brightest massive proto-clusters	14 hours	Approved
ALMA 2014	Cycle 2: 2013.1.00269.S: Sgr B2 - The Proving Ground for Star Formation Theories	6 hours	In Progress
LOFAR 2014	Cycle 2: LC2_006: A search for p-H ₂ CO, a potential EoR contaminant, toward the Galactic Center, W43, W44, W49, and M82.	8 hours	Observed (2014)
APEX 2014	H ₂ CO Thermometry of the CMZ to understand its low star formation rate	250 hours	Observed (2014)
GBT 2014	GBT14A-110/GBT12B-221: Density Measurements in G0.253+0.016: Pilot program for CMZ H ₂ CO densitometry	18 hours	Observed (2014)
KPNO 2013	2013A-0399: Star formation in the Central Molecular Zone: Massive Outflows in Sgr C	6 hours	Observed (2013)
EVLA 2013	13A/064: Massive stars and ionized gas in the W51 complex	13 hours, 4 configs	Observed (2014)
Arecibo 2012	A2854: Density Map of the W51 Giant Molecular Cloud complex	13 hours	In Press: A&A 2014
GBT 2010	GBT10B-019: Densitometry of young star-forming complexes throughout the Galaxy	120 hours	Published: 2013ApJ...779...50G
Arecibo 2010	A2584: Densitometry of young star-forming complexes throughout the Galaxy	60 hours	Published: 2013ApJ...779...50G
GBT 2009	GBT09C-049: Measuring the dense gas mass fraction with H ₂ CO absorption	4 hours	Published: 2011ApJ...736..149G

Other relevant observing:

I was an active user of the Apache Point Observatory (APO) while at the University of Colorado, using a few dozen nights of TripleSpec, NICFPS, and DIS time to examine outflows in Sh 2-233 (IRAS 05358+3543), W5, Orion BN/KL, W51, and Sgr C.

I am Co-I on successful proposals to the VLT, Gemini, SOFIA, HST, ALMA, IRAM 30m, HHT/SMT, APEX, Herschel, GBT, VLA, and Arecibo. Please ask me if you would like the complete detailed list.

Computing:

I am an active developer of a large variety of astronomical python software tools and a contributor to **astropy** and its affiliates. My github profile (github.com/keflavich) contains a complete list of projects. Below is a selection of my most popular packages:

- **astroquery** (astroquery.readthedocs.org): a toolkit for querying internet-hosted astronomical databases.

- `pyspeckit` (pyspeckit.bitbucket.org): a software suite for visualizing and analyzing spectral line and spectral cube data
- `spectral-cube` (spectral-cube.rtdfd.org): a library for the manipulation of radio spectral cube data
- `pyradex` (github.com/keflavich/pyradex): an object-oriented frontend to the popular RADEX radiative transfer code and its peers.
- `image-registration` (github.com/keflavich/image_registration): a package designed to determine and correct the offsets between images containing only diffuse emission
- `FITS-tools` (github.com/keflavich/FITS_tools): a collection of tools for slicing and reprojecting FITS images and cubes

Service:

- Organizer of the “Python Coffee and Tutorial” series at ESO, 2014
- Referee for the following journals:
 - *Science*
 - *Astrophysical Journal*
 - *Astronomy & Astrophysics* (main journal and letters)
 - *Monthly Notices of the Royal Astronomical Society*
 - *Revista Mexicana de Astronomía y Astrofísica*
- Panel chair for a recent NASA grant review panel
- ESO ALMA Fellow Duties. Primary duties include software development and maintenance of the Quality Assurance Packager software
- Co-organizer of the December 2014 ALMA Postdoc Symposium in Tokyo
- Member of the `montage` (montage.ipac.caltech.edu) Image Mosaic Engine users group
- Member of the CCAT ISM working group
- Member of the Next-Generation VLA (NGVLA) high mass star formation working group