Angela Speck – Curriculum Vitae

Contact Information:

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NATIONALITY/IMMIGRATION	British/Permanent U.S. Resident (since October 2006)	

Education:

June 1995-Sept 1998	Ph.D.	University College London
Sept 1989-June 1992	B.Sc. (Hons.) - Astrophysics	Queen Mary, University of London

Positions held:

Assistant Professor of Physics	University of Missouri – Columbia	Aug 2002-present
Adjunct Professor of Geology	University of Missouri – Columbia	March 2007-present
Postdoctoral Research Associate	University of Illinois at Urbana-Champaign	June 1999-Aug 2002
Postdoctoral Research Assistant	University College London	Oct 1998-June 1999
Demonstrator (TA)	University College London	Oct 1995-June 1998
Research & Development Tech.	Mountain Breeze	Mar 1993-Sep 1993

Research Themes *(see attached Research Statement)*:

Late stages of stellar evolution: AGB stars to planetary nebulae; Infrared spectroscopic and photometric observations of dust and molecules; Astromineralogy: composition and formation of circumstellar and interstellar dust.

Grants, Honours & Awards

Spitzer Space Telescope: $11,525* (and time); "*Excavating the Mass Loss History in the Circumstellar Dust Shells of Evolved Stars (Spitzer-MLHES)"*, PI: Toshiya Ueta. (08/01/07 - 05/31/10) *Co-I Speck funding.

Spitzer Space Telescope: $8,500* (and time); "*SAGE-Spectroscopy: The life cycle of dust and gas in the Large Magellanic Cloud"*, PI: Alexander Tielens. (08/01/07 - 05/31/10) *Co-I Speck funding.

Spitzer Space Telescope: $5000* (and time); "The circumstellar - interstellar interface revealed*"*, PI: Robert Stencel. (08/01/07 - 05/31/10) *Co-I Speck funding.

NSF CAREER: $488,558; "*CAREER: A multi-faceted investigation of the astromineralogy and evolution of dust around low- and intermediate mass evolved stars*", PI: Angela Speck (05/15/07 – 04/30/12)

NSF AST: $196,702; "*Collaborative Research: Dust formation around carbon stars: astromineralogy and the condensation sequence*", PI: Angela Speck (07/15/06 – 06/30/09)

Spitzer Space Telescope: $11,020* (and time); "*The Dust Condensation Sequence at Low Metallicity: AGB Stars in NGC 6822"*, PI: Schuyler Van Dyk. (02/01/06–05/31/08) *Co-I Speck funding.

Spitzer Space Telescope: $51,885 (and time); "*MIPS Infrared Imaging of AGB Dustshells (MIRIAD): tracing mass-loss history in the extremely large shells around evolved stars"*, PI: Angela Speck, (08/10/05 - 05/31/08) *Co-PI Speck's funding.

University of Missouri Research Board: $30,945; "*Astromineralogy: dust around evolved stars in the Magellanic Clouds"*, PI: Angela Speck (09/01/2005 – 08/31/2006)

MU Research Council/Summer Research Fellowship: $7,500(RC), $3500 (SRF); "*Evolution of Molecular Gas and the Origin of Cometary Knots in Planetary Nebulae"*, PI: Angela Speck, (07/01/05 – 06/30/06)

Hubble Space Telescope: $32,997; "*Evolution of molecular gas and the origin of cometary knots in planetary nebulae"*, PI: Angela Speck (07/01/05 - 06/30/07).

NASA: $44,570*; "*Distinguishing Grain-Size and Temperature Effects on the Infrared Fingerprints of Astrominerals: A Quantitative Laboratory Approach"*, PI: Anne Hofmeister (Washington University), Co-PI: Angela Speck (02/01/2005 to 01/31/2008) *Co-PI Speck's funding.

NASA Astrophysics Data Program: $105,000; "*Astromineralogy: dust around evolved stars in the Magellanic Clouds"*, PI: Angela Speck (03/01/2003 to 02/28/2005)

NASA Astrophysics Data Program: $95,000; "*Extremely extended dust shells around evolved stars: mass-loss histories, thermal pulses and stellar evolution"*, PI: Angela Speck (02/01/2002 to 01/31/2004)

MU Faculty International Travel Award $1500 to attend "Why Galaxies Care About AGB Stars" conference in Vienna, Austria, Aug 2006.

AAS travel grant to attend the "Workshop on Pulsating Mass-losing Stars" workshop, Sendai, Japan, May 2002

AAS travel grant to attend the "Origin and Evolution of Interstellar Silicates" workshop, Leiden, The Netherlands, 2001.

Royal Society grant to attend the "IAU Symposium 197 – Astrochemistry" in Cheju Island, South Korea, Aug 1999.

IAU grant to attend "IAU Symposium 197 – Astrochemistry" in Cheju Island, South Korea, Aug 1999.

IAU grant to attend "IAU Symposium 191 - AGB Stars" in Montpellier, France, Aug 1998.

Winner of the Royal Society of Chemistry, Skinner Poster Prize – 1998

Washington University (St Louis) grant to attend "Astrophysical Implications of the Lab Study of Presolar Grains" conference in St Louis, Oct 1996.

Teaching and Educational Activities *(see attached Teaching Statement)*:

- Courses taught: Astronomy 1010, Introduction to Astronomy; Astronomy 1020, Introduction to Laboratory Astronomy; Astronomy 3010, Introduction to Modern Astrophysics; Astronomy 4180/7180: Solar System Science; Astronomy 4250: Stellar Astrophysics; Astronomy 7301, Topics in Astronomy and Astrophysics: Stellar Structure and Evolution.
- Currently advisor to 3 doctoral students and 1 masters student.
- Research advisor to 1 postdoc and 12 undergraduate students since Winter 2002 (4 current).
- Supervised 28 (both national and international) conference presentations by students since 2004.
- Took two female undergraduates on a research observing trip to Mauna Kea, Hawaii (Fall 2002)

Professional Affiliations & Activities:

- Fellow of the Royal Astronomical Society,
- Full member of the American Astronomical Society,
- Member of the Astronomical Society of the Pacific,
- Member of the Meteoritical Society.
- Member of NOAO Users Committee.
- Panel member in Spitzer Space Telescope Cycle 3 Review Panel (2006).
- Reviewer of journal articles in e.g. ApJ, AJ, A&A, MNRAS, Nature, Science etc. (~3-4/year)
- Reviewer of NASA ROSES proposals.
- Regular source for scientific stories in the Columbia Missourian (local newspaper) and on local radio/television.

Invited Talks:

Conferences:

- Workshop on Interstellar Silicates, April 17 – 20, 2001, Lorentz Center, University of Leiden, The Netherlands, "Circumstellar dust around oxygen-rich evolved stars".
- Asymmetrical Planetary Nebulae III: Winds, Structure and the Thunderbird, July 28 - August 1, 2003, Mt. Rainer, Washington, "Episodic Mass Loss on the Timescale of Thermal Pulses: Radiative Transfer Modeling of the Egg Nebula".
- Workshop on Cometary Dust in Astrophysics, August 10-15, 2003, Crystal Mountain, Washington "Observational Evidence for Presolar Grains Around Oxygen-rich Evolved Stars";
- Mid-America Regional Astrophysics Conference, April 15-16, 2005, UMKC, Kansas City, MO, "The Nature of Stardust: Circumstellar Shells Around Evolved Stars"
- AAS 206th Meeting, May 29 - June 2, 2005, Minneapolis, MN, in Session 28: Formation and Fate of Stardust "Mineralogy of Dust in the Outflows of Asymptotic Giant Branch Stars"
- Astronomy with Radioactivities V: From Gamma Rays to Stardust, September 5-9, 2005: Clemson University, SC, "Effects of Stellar Evolution on the Nature of SiC Grains in Outflows of C Stars"

Colloquiua:

- University of Missouri, Geological Sciences, February 2007 "The Nature of Stardust: Astromineralogy and the Dust Around Aging Stars"
- Kansas University, May 2005, "Stardust: Observational Evidence of Mass-loss Processes During the Late Stages of Stellar Evolution"
- Truman State University, April 2005, "Stardust: Observational Evidence of Mass-loss Processes During the Late Stages of Stellar Evolution"
- University of Missouri at Kansas City, November 2003 "Stardust: Observational Evidence of Mass-loss Processes During the Late Stages of Stellar Evolution"
- University of Missouri at St Louis, November 2003 "Stardust: Observational Evidence of Mass-loss Processes During the Late Stages of Stellar Evolution"
- University of Minnesota Feb 2003 "Large-Scale Extended Emission Around the Helix Nebula"
- University of Iowa, April 2002 "The Life Cycle of Dust: Birth around Evolved Stars"
- Northern Arizona University, March 2002 "The Life Cycle of Dust: Birth around Evolved Stars"
- University of Wisconsin – Madison, February 2002 "The Life Cycle of Dust: Birth around Evolved Stars"
- University of Wyoming, January 2002 "The Life Cycle of Dust: Birth around Evolved Stars"
- University of Kentucky, 2001 "Mass-loss from AGB stars"
- University of Illinois Urbana-Champaign, 1999, "Astromineralogy"

Public talks:

- Columbia Public Schools Astronomy Day, May 2005 "Planetary Nebulae: What a Beautiful Way to Die";
- Saturday Morning Science, April 2005 "Planetary Nebulae: What a Beautiful Way to Die";
- Ladd Observatory at Brown University, November 2004 "Planetary Nebulae: what a beautiful way to die";
- Saturday Morning Science (x3), October 2003 "The Origin of the Elements"; "The Moon"; "Formation of the Solar System"
- Columbia Public Schools Gifted Program, December 2003 and 2004.

Observational Programs:

Observing time received since September 2004:

- Spitzer Space Telescope, 30 hours to observe large circumstellar dust shell in the far infrared (PI)
- Spitzer Space Telescope, 32.6 hours to observe spectra of evolved stars in NGC 6822 (co-I)
- Gemini North/Michelle, 4 hours to do spatial resolved spectroscopic observations of SiC emission from carbon stars (PI)
- VLT/SINFONI, 3 half-nights to do spatially resolved spectroscopic measurements of Molecular Hydrogen Lines in the
- Globules in the Planetary Nebula NGC 7293 (co-I)
- Hubble space telescope, 16.1 hours to observe the evolution in dust emission from supernovae. (co-I)
- Spitzer Space Telescope, 24.5 hrs to observe more large circumstellar dust shells in the far infrared (co-I)
- Spitzer Space Telescope, 235 hrs legacy program to obtain spectroscopy of objects in the LMC (co-I)
- Spitzer Space Telescope, ~2.5 hrs to do far-infrared spectroscopy of bow-shock in R Hya. (co-I)
- Subaru/MOIRCS, 1 night to obtain medium resolution spectra of molecular hydrogen in multiple globules (co-I)

Pending observing proposals

- Gemini North/Michelle, requested time to do spatially resolved spectroscopic observations of UIR band emission carbon stars (co-I)
- Gemini South/T-ReCs, requested time to do spatially resolved spectroscopic observations of 13um emission from O-rich AGB stars (PI)
- Gemini South/Phoenix, requested time to do spatially resolved spectroscopic observations of molecular hydrogen lines in globules/knots in the Helix Nebula (co-I)

Publications:

Total publications: 28 peer-reviewed; >20 conference proceedings; >50 conference presentations, 6 invited conference talks since 2003, *h*-factor = 11, total citations > 350. See publications and conference lists below for details.

Many of the following are available to download via my personal or group website at http://www.missouri.edu/~speckan and http://stardust.astro.missouri.edu

* denotes undergraduate, † denotes graduate student and ‡ denotes postdoctoral researcher advised by Angela Speck.

Manuscripts in review or in preparation:

1. Corman, Adrian B.†, Wakeman, Kristina*, Speck, Angela K., Thompson, Grant*, "Silicon Carbide Absorption in Extreme Carbon Stars: Radiative Transfer Modeling", 2007 in preparation [started in August 2006]
2. Adrienne Dove* & Angela K. Speck, "CLOUDY modeling of weird Far-IR emission in the central zone of the Helix Nebula ", 2007, in preparation [started in March/April 2006].
3. DePew, Kyle†, Speck, Angela K., Dijkstra, Catharinus‡ & Anne M. Hofmeister, "Astromineralogy of the 13 Micron Feature in the Spectra of Oxygen-Rich AGB Stars. II. Silica", 2007, in preparation [started in May 2006].
4. Pitman K.M.‡, Hofmeister A.M., Speck A.K., Dijkstra C.‡, "Room temperature forsterite and fayalite absorbances", 2007, MNRAS in preparation [started in March/April 2006].

5. Pitman K.M.‡, Hofmeister A.M., Speck A.K., "Laboratory measurements of silicon carbide I. Optical constants and reflectance spectra", 2007, A&A in preparation [started in July 2006].
6. Matsuura, M., Speck, A.K., Smith, M.D. , Zijlstra, A.A., Lowe, K.T.E., Viti, S., Redman, M., Wareing, C.J., Lagadec, E., "VLT / Infrared Integral Field Spectrometer Observations of Molecular Hydrogen Lines in the Globules in the Planetary Nebula NGC 7293 (the Helix Nebula)", 2007, *Monthly Notices of the Royal Astronomical Society*, in review.
7. Angela Speck, Karen Wilson*, Josh Tartar†, Margaret Meixner, D. C. Lis, Maia Nenkova, & Moshe Elitzur "An Extremely Extended Dust Shell around AFGL 618: Submillimeter Imaging and Radiative Transfer Modeling", 2007, *Astrophysical Journal*, in post-review revision.

Refereed Publications:

1. Grant D. Thompson*, Adrian B. Corman†, Angela K. Speck, & Catharinus Dijkstra‡, "Challenging the Carbon Star Dust Condensation Sequences: Anarchist C-Stars", 2006, *Astrophysical Journal*, 652, 1654-1673.
2. Dijkstra, C.‡, & Speck, A.K., "Shaping Bipolar Planetary Nebulae: How Mass Loss Leads to Waistline Development ", 2006, *Astrophysical Journal*, 651, 288-293.
3. Angela K. Speck, Jan Cami, Ciska Markwick-Kemper, Jarron Leisenring, Ryszard Szczerba, Catharinus Dijkstra‡, Schuyler Van Dyk, & Margaret Meixner, "The Unusual Spitzer Spectrum of the Carbon Star IRAS 04496-6958: A Different Condensation Sequence in the LMC?", 2006, *Astrophysical Journal*, 650, 892-900.
4. C. Wareing, A. Zijlstra, T. Ueta, A. K. Speck, R. E. Stencel, M. Elitzur, R. Gertz, F. Herwig, H. Izumiura, W. Latter, M. Matsuura, M. Meixner, M. Steffen, & R. Szczerba "Detached shells as tracers of AGB-ISM bow shocks" 2006, *Monthly Notices of the Royal Astronomical Society*, 372, L63-L67.
5. K. M. Pitman‡, A. K. Speck & A. M. Hofmeister, "Challenging the Identification of Nitride Dust in Extreme Carbon Star Spectra", 2006, *Monthly Notices of the Royal Astronomical Society*, 371, 1744-1754.
6. T. Ueta, A. K. Speck, R. E. Stencel, M. Elitzur, R. Gertz, F. Herwig, H. Izumiura, W. Latter, M. Matsuura, M. Meixner, M. Steffen, R. Szczerba, & A. Zijlstra, "Detection of a Bow-Shock-Like Far-IR Nebula Associated with R Hya: the First MIRIAD Results", 2006, *Astrophysical Journal Letters*, 648, L39-L42.
7. Ben E. K. Sugerman, Barbara Ercolano, M. J. Barlow, A. G. G. M. Tielens, Geoffrey C. Clayton, Albert A. Zijlstra, Margaret Meixner, Angela Speck, Tim M. Gledhill, Nino Panagia, Martin Cohen, Karl D. Gordon, Martin Meyer, Joanna Fabbri, Janet. E. Bowey, Douglas L. Welch, Michael W. Regan & Robert C. Kennicutt, Jr. "Massive-Star Supernovae as Major Dust Factories", 2006, *Science*, 313, 196.
8. DePew, Kyle†, Speck, Angela, Dijkstra, Catharinus‡, "Astromineralogy of the 13 μm feature in the spectra of oxygen-rich asymptotic giant branch stars. I. Corundum and spinel", 2006, *Astrophysical Journal*, 640, 971-981.
9. Speck, Angela K., Thompson, Grant D.*, Hofmeister, Anne M., "The Effect of Stellar Evolution on SiC Dust Grain Sizes", 2005, *Astrophysical Journal*, 634, 426-435.
10. Dijkstra, C. ‡, Speck, A.K.; Reid, R. B.*, Abraham, P., "The 10 mum Feature of M-Type Stars in the Large Magellanic Cloud and the Dust Condensation Sequence" 2005, *Astrophysical Journal Letters*,.633, 133-136.

11. Meixner, M., McCullough, P.R., Hartman, J., Son. M., Speck, A.K., "Molecular Hydrogen Knots in the Helix Nebula" 2005, *Astronomical Journal*, 130, 1784-1794.
12. Speck, A.K., Hofmeister, A.M., "Processing of presolar grains around post-AGB stars: silicon carbide as the carrier of the ``21"μm feature.", 2004, *Astrophysical Journal*, 600, 986-991.
13. O'Hara, Timothy B., Meixner, Margaret, Speck, Angela K., Ueta, Toshiya, Bobrowsky, Matthew, "The Dust Ring of Luminous Blue Variable Candidate HD 168625: Infrared Observations and Model Calculations" 2003 *Astrophysical Journal*, 598, 1255-1264.
14. Hofmeister, A.M., Keppel, E. & Speck, A.K., "Absorption and reflection infrared spectra pf MgO and other diatomic compounds" 2003, *Monthly Notices of the Royal Astronomical Society*, 345, 16-38.
15. Speck, A.K., Meixner, M., Jacoby, G.H. & Knezek, P., "Molecular hydrogen in the Ring Nebula: clumpy photo-dissociation regions" 2003, *Publications of the Astronomical Society of the Pacific*, 115, 170-177.
16. Meixner, M., Ueta, T., Bobrowsky, M., & Speck, A.K., **"**Two Subclasses of ProtoPlanetary Nebulae: Model Calculations" 2002, *Astrophysical Journal*, 571, 936-946.
17. Speck, A.K., Meixner, M., Fong, D., McCullough, P.R., Moser, D. & Ueta, T., "Large-scale extended emission around the Helix Nebula: dust, molecules, atoms and ions." 2002, *Astronomical Journal*, 123, 346-361.
18. Speck, A.K., Meixner, M. & Knapp, G.R., "Discovery of parsec-sized dust shells around AFGL2688 and AFGL 618" 2000, *Astrophysical Journal Letters* , 545, L145-L148.
19. Speck, A.K., Barlow, M.J., Sylvester, R.J., & Hofmeister, A.M., "Dust features in the 10-μm infrared spectra of oxygen-rich evolved stars" 2000, *Astronomy & Astrophysics Supplement Series*, 146, 437-464.
20. Speck, A.K., Hofmeister, A.M., & Barlow, M.J., "Silicon Carbide: The Problem with Laboratory Spectra" 2000, In *Thermal Emission Spectroscopy of Dust, Disks, and Regoliths*, Eds: Sitko M.L., Sprague A.L. & Lynch D.K., ASP Conference Series, vol. 196, 281-290.
21. Hofmeister, A.M., Rosen, L.J., Speck, A.K., "IR spectra of nano- and macro-crystals: the overriding importance of optical path" 2000, In *Thermal Emission Spectroscopy of Dust, Disks, and Regoliths*, Eds: Sitko M.L., Sprague A.L. & Lynch D.K., ASP Conference Series, vol. 196, 291-299.
22. Bowey, J. E., Adamson, A. J., Speck, A.K., "Simulation of 10μm Astronomical Spectra with Mixtures of Crystalline and Amorphous Silicates" 2000, In *Thermal Emission Spectroscopy of Dust, Disks, and Regoliths*, Eds: Sitko M.L., Sprague A.L. & Lynch D.K., ASP Conference Series, vol. 196, 31-39.
23. Speck, A.K., Hofmeister, A.M., & Barlow, M.J., "The silicon carbide problem: astronomical and meteoritic evidence" 1999, *Astrophysical Journal Letters* , 513, L87-L90.
24. Cohen, M., Barlow, M.J., Sylvester, R.J., Liu, X.-W., Cox, P., Lim, T., Scmitt, B. & Speck, A.K., "Ice, silicates and PAH emission features in the ISO spectrum of the carbon-rich planetary nebula CPD-56 8032" 1999, *Astrophysical Journal Letters* , 513, L135-L138.
25. Speck, A.K., Barlow, M.J., & Skinner, C.J., "The nature of the silicon carbide in carbon star outflows" 1997, *Monthly Notices of the Royal Astronomical Society*, 288 , pp431-456.
26. Speck, A.K., Barlow, M.J., & Skinner, C.J., "The nature of silicon carbide: astronomical observations vs meteoritic evidence" 1997, *Meteoritics & Planetary Science* , 32, No. 5, 702-712.
27. Franchi, I.A., Bland, P., Berry, F.J., Speck, A., & Pillinger, C.T., "The influence of weathering on the measured oxygen isotopic compositon of ordinary chondrites" 1994, *Meteoritics*, 29, 467.

Conference Proceedings:

28. Adrian Corman†, Grant Thompson*, Angela Speck & Catharinus Dijkstra‡, "The Carbon Star Dust Sequence: Evolution of the Silicon Carbide in Dust Circumstellar Outflows of Carbon Stars", 2007, in Proceedings of *Why Galaxies Care About AGB Stars*, editors: F. Kerschbaum, C. Charbonnel & R. Wing, in press.
29. Angela Speck, Toshiya Ueta and the MIRIAD TEAM, "Spitzer/MIPS Imaging of the Extremely Extended Dust Shell(s) around R Hya", 2006, In Proceedings of *IAU Symposium 234: Planetary Nebulae in Our Galaxy and Beyond*, editors: M.J. Barlow. & R.H. Mendez, in press
30. Adrienne Dove*, Angela Speck, "CLOUDY modeling of weird Far-IR emission in the central zone of the Helix Nebula", 2006, In Proceedings of *IAU Symposium 234: Planetary Nebulae in Our Galaxy and Beyond*, editors: M.J. Barlow. & R.H. Mendez, in press
31. Josh Tartar†, Sarah Eyermann†, Angela Speck, Margaret Meixner, "HST Study of the Molecular Gas in Planetary Nebulae", 2006, In Proceedings of *IAU Symposium 234: Planetary Nebulae in Our Galaxy and Beyond*, editors: M.J. Barlow. & R.H. Mendez, in press
32. C. Dijkstra‡, A. K. Speck, R.B. Reid*, C. Markwick-Kemper, J. Leisenring, "Circumstellar dust in the Large Magellanic Cloud", 2006, In Proceedings of *Stellar Evolution at Low Metallicity: Mass Loss, Explosions, Cosmology*, editors: Lamers, Langer, Nugis & Annuk, in press
33. Eyermann, S. E. †, Speck, A. K., Meixner, M., McCullough, P. R., Hora, J., "The Nature and Origin of Molecular Knots in Planetary Nebulae", 2006, *Planetary Nebulae as Astronomical Tools*. AIP Conference Proceedings, 804, 145.
34. Speck, A.K.,, Meixner, M., & Elitzur, M., "Episodic Mass Loss on the Timescale of Thermal Pulses: Radiative Transfer Modeling" 2003, In the proceedings of the 3rd *Asymmetrical Planetary Nebulae Conference*, Eds. M.Meixner & J.Kastner, ASP Conference Proceedings, Vol. 313. San Francisco: Astronomical Society of the Pacific, 2004., p.303.
35. Meixner, M., McCullough, P., Hartman, J., O'Dell, R., Speck, A.K., "The Hubble Helix" 2003, In the proceedings of the 3rd *Asymmetrical Planetary Nebulae Conference*, Eds. M.Meixner & J.Kastner, ASP Conference Proceedings, Vol. 313. San Francisco: Astronomical Society of the Pacific, 2004., p.234.
36. Speck, A.K.,, Meixner, M., Nenkova, M. & Elitzur, M., "Radiative transfer modeling of periodic mass-loss enhancements during the AGB phase" 2002, In the proceedings of the *Workshop on Mass-losing Pulsating Stars and their Circumstellar Matter*, Eds. Y. Nakada & M. Honma, 241.
37. Speck, A.K.,, Meixner, M., Knezek, P. & Jacoby, G.H. "High resolution molecular hydrogen imaging of the Ring nebula" 2003, In the proceedings of the *IAU Symposium 209, Planetary Nebulae: Their Evolution and Role in the Universe*, Eds. S. Kwok, M. Dopita & R. Sutherland, 271.
38. Speck, A.K.,, & Hofmeister, A.M., "Silicon Carbide as the Carrier of the 21μm feature", 2003, In the proceedings of the *IAU Symposium 209, Planetary Nebulae: Their Evolution and Role in the Universe*, Eds. S. Kwok, M. Dopita & R. Sutherland, 315.
39. Speck, A.K.,, Meixner, M., Fong, D. McCullough, P.R., Moser, D.E. & Ueta, T., " Large-scale extended emission around the Helix Nebula" 2003, In the proceedings of the *IAU Symposium 209, Planetary Nebulae: Their Evolution and Role in the Universe*, Eds. S. Kwok, M. Dopita & R. Sutherland, 316.

40. Speck, A.K.,, Meixner, M., Fong & Ueta, T., "ISOPHOT Observations of Post-AGB Stars: Fossil Records of Mass Loss" 2002, In proceedings of the *ISOPHOT Workshop on P32 Oversampled Mapping*, Eds. B. Schulz, S. Peschke, ESA-SP 482, 93.
41. Speck, A.K.,, Meixner, M. & Ueta, T., "Big, bumpy dust shells around protoplanetary nebulae" 2001, In proceedings of *Post-AGB objects as a phase of stellar evolution*, Eds. R. Szczerba, S.K. Gorny, Kluwer, Dordrecht, 333.
42. Ueta, T., Speck, A.K., Meixner, M. , Dayal, A., Deutsch, L.K., Fazio, G., Hora, J.L., Hoffmann, W.F., "Spatial Distributions of Multiple Dust Components in the PPN/PN Circumstellar Dust Shells" 2001, In proceedings of *Post-AGB objects as a phase of stellar evolution*, Eds. R. Szczerba, S.K. Gorny, Kluwer, Dordrecht, 339.
43. Speck, A.K.,, Meixner, M., Ueta, T. & Knapp, G.R., ". ISOPHOT observations of protoplanetary nebulae: evidence for extremely extended dust shells around post-AGB objects" 2001, In proceedings of *Tetons 4: Galactic Structure, Stars and the Interstellar Medium*, Eds. C.E. Woodward, M.D. Bicay, and J.M. Shull, A.S.P. conf. ser. 231, 550.
44. Speck, A.K.,, Barlow, M.J., & Sylvester, R.J., "Mineralogy of dust around oxygen-rich evolved stars" 2001, In proceedings of *Tetons 4: Galactic Structure, Stars and the Interstellar Medium*, Eds. C.E. Woodward, M.D. Bicay, and J.M. Shull, A.S.P. conf. ser. 231, 553.
45. Speck, A.K., Meixner, M., & Knapp, G.R., "Circumstellar Dust Around Post-AGB Stars" 2000, In Proceedings of *ISO Beyond Point Sources: Studies of Extended Infrared Emission*, September 14-17, 1999, ISO Data Centre, Villafranca del Castillo, Madrid, Spain. Edited by R. J. Laureijs, K. Leech and M. F. Kessler, ESA-SP 455, 2000. p. 83.
46. Hofmeister, A.M., Keppel, E.T., Bowey, J.E., & Speck, A.K., "Causes of artifacts in the infrared spectra of powders" 2000, In Proceedings of *ISO beyond the peaks: The 2nd ISO workshop on analytical spectroscopy*, February 2-4, 2000, at ISO Data Centre, Villafranca del Castillo, Madrid, Spain. Edited by A. Salama, M.F.Kessler, K. Leech & B. Schulz. ESA-SP 456, 2000. p 343.
47. Speck, A.K., & Barlow, M.J., "UIR Bands in Carbon Stars" 1997, *Astrophysics & Space Science* , 251 pp115-121. Also in *Dust & Molecules in Evolved Stars*: Conference Proceedings
48. Speck, A.K., Barlow, M.J., & Skinner, C.J., "Observations of the 11 micron Silicon Carbide Feature in Carbon Star Shells" 1996, In *From Stardust to Planetesimals: Contributed Papers,* Eds: M.E.Kress, A.G.G.M. Tielens and Y.J. Pendleton, NASA Conf. Publ. 3343, California, pg 61.

Selected Abstracts

1. Finding Stellar Properties: From Parallax to Radius - POSTER
   Lanika Ruzhitskaya† & Angela Speck,
   Cosmos in the Classroom, Pomona, CA, August 3 -5, 2007
2. Dust at Low Metallicity: Spitzer Observations of AGB Stars in NGC 6822 - POSTER
   Schuyler Van Dyk, Ciska Kemper, Angela Speck, Ryzsard Szczerba, Margaret Meixner, E. Peeters & T.Ueta
   American Astronomical Society Meeting 209, Seattle, WA, January 2007, #168.13
3. Laboratory Infrared Optical Constants and Reflectance Spectra of Silicon Carbide - POSTER
   Karly M. Pitman†, Anne M. Hofmeister & Angela K. Speck
   American Astronomical Society Meeting 209, Seattle, WA, January 2007, #06.02

4. Spitzer/MIPS infrared imaging of extremely extended circumstellar shells - TALK
   Angela Speck & the MIRIAD team
   Why Galaxies Care About AGB Stars, Vienna, Austria, August 7-11th 2006.
5. Carbon Star Dust Sequence: Evolution of the SiC in Dust Circumstellar Outflows of C-Stars - POSTER
   Adrian Corman†, Grant Thompson*, Angela Speck & Catharinus Dijkstra‡
   Why Galaxies Care About AGB Stars, Vienna, Austria, August 7-11th 2006.
6. SiO2 Around O-rich AGB Stars - Astromineralogy & The "13μm" Feature – POSTER
   Kyle DePew†, Angela Speck, Anthony Smith*, Catharinus Dijkstra‡ & Anne Hofmeister.
   Why Galaxies Care About AGB Stars, Vienna, Austria, August 7-11th 2006.
7. Tracing the mass loss Histories of post-AGB Stars : ISOPHOT imaging – POSTER
   B.M. Mchunu†, Angela Speck & Margaret Meixner
   Why Galaxies Care About AGB Stars, Vienna, Austria, August 7-11th 2006.
8. CLOUDY Modeling of Weird Far-IR Emission in the Central Zone of the Helix Nebula - POSTER
   Adrienne Dove* & Angela Speck - POSTER
   IAU Symposium 234: Planetary Nebulae in our Galaxy and Beyond, Waikaloa, HI, April 3-7 2006.
9. Spitzer/MIPS Infrared Imaging of the Extremely Extended Circumstellar Dust Shells - POSTER
   Angela K. Speck, Toshiya Ueta, Robert Stencel & the MIRAD team.
   IAU Symposium 234: Planetary Nebulae in our Galaxy and Beyond, Waikaloa, HI, April 3-7 2006.
10. An HST Study of the Molecular Gas in Planetary Nebulae - POSTER
    Josh Tartar†, Angela Speck, & Sarah Eyermann†
    IAU Symposium 234: Planetary Nebulae in our Galaxy and Beyond, Waikaloa, HI, April 3-7 2006.
11. The 3μm water ice/vapour feature of (post-)AGB stars - POSTER
    Dijkstra, C.‡, Justtanont, K., Dominik, C., Waters, L., Matsuura, M., Speck, A. K., Cami, J., Yamamura, I.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.18
12. Tracing the mass-loss histories of (post-)AGB stars: ISOPHOT imaging - POSTER
    Mchunu, B. M.†, Speck, A. K. Meixner, M.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.17
13. SiO2 Around O-rich AGB Stars - Mineralogy & The "13μm" Feature - POSTER
    DePew, K. D.†, Speck, A. K., Dijkstra, C.*, Hofmeister, A. M.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.16
14. Spitzer/MIPS Infrared Imaging of the Extremely Extended Circumstellar Dust Shell of HD 161796 - POSTER
    Speck, A. K., Ueta, T., Stencel, R., MIRIAD Collaboration
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.15
15. Radiative Transfer Modeling of the Extended Dust Shell of AFGL 618 - POSTER
    Tartar, J.†, Speck, A., Meixner, M., Nenkova, M., Elitzur, M.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.14
16. The Carbon Star Dust Sequence: Evolution of the SiC Dust Circumstellar Outflows of C-Stars - POSTER
    Thompson, G. D.*, Speck, A. K., Dijkstra, C.‡
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.07

17. An Investigation of the Dust Shells Around Carbon Stars Using Radiative Transfer Modeling - POSTER
    Corman, A. B.†, Speck, A. K.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #182.05
18. HST study of the molecular gas in planetary nebulae - POSTER
    Hamacher, D.†, Eyermann, S.†, Speck, A. K., Meixner, M.
    American Astronomical Society Meeting 207, Washington, DC, January 2006 #08.08
19. Mineralogy of Dust in the Outflows of Asymptotic Giant Branch Stars - ORAL
    Speck, A.K.
    American Astronomical Society Meeting 206, Minneapolis, MN, June 2005 #28.02 (invited talk)
20. Submillimeter Imaging of Fossil Dust Shells around Post-AGB Stars - POSTER
    Wilson, K.*, Speck, A., Lis, D., Meixner, M.
    American Astronomical Society Meeting 206, Minneapolis, MN, June 2005 #08.04
21. Modeling Periodic Mass-loss Changes in the Fossil Shells around Post-AGB Stars - POSTER
    Tartar, J.*, Speck, A., Meixner, M., Elitzur, M.
    American Astronomical Society Meeting 206, Minneapolis, MN, June 2005 #06.06
22. The Nature and Evolution of Silicon Carbide in the Outflows of Carbon Stars - POSTER
    Thompson, G. D.*, Speck, A. K., Hofmeister, A. M.
    American Astronomical Society Meeting 206, Minneapolis, MN, June 2005 #06.05
23. Dust around evolved stars in the Magellanic Clouds - POSTER
    Reid, B.*, Speck, A., Dijkstra, R.‡
    American Astronomical Society Meeting 206, Minneapolis, MN, June 2005 #06.03
24. The Evolution of Molecular Hydrogen in Planetary Nebulae - POSTER
    Eyermann, S. E.†, Speck, A.K.
    American Astronomical Society Meeting 205, San Diego, CA, January 2005 #138.11
25. Astromineralogy of Intermediate Mass Evolved Stars in the Magellanic Clouds - POSTER
    Reid, R. B.*, Speck, A.K.
    American Astronomical Society Meeting 205, San Diego, CA, January 2005 #58.03
26. Stardust: observational evidence of mass-loss processes in the history of the Egg Nebula - POSTER
    Tartar, J.*, Speck, A.K.
    American Astronomical Society Meeting 205, San Diego, CA, January 2005 #58.02
27. Silicon carbide: a case study in the astrophysics of stardust - POSTER
    Speck, A.K.
    American Astronomical Society Meeting 205, San Diego, CA, January 2005 #58.01
28. Observational Evidence for Presolar Grains around Oxygen-rich Evolved Stars - POSTER
    Speck, A.K., Hofmeister, A. M.
    American Astronomical Society Meeting 203, Atlanta, GA, January 2004 #49.06
29. Processing of presolar grains around post-AGB stars: SiC as the carrier of the ``21"μ m feature - POSTER
    Hofmeister, A. M., Speck, A.K.
    American Astronomical Society Meeting 203, Atlanta, GA, January 2004 #49.09

30. Episodic Mass Loss on the Timescale of Thermal Pulses: Radiative Transfer Modeling - POSTER
    Miller, B. A.*, Speck, A.K., Meixner, M.
    American Astronomical Society Meeting 203, Atlanta, GA, January 2004 #49.08
31. The carrier of the 13mu m feature in the spectra of O-rich AGB stars - POSTER
    Mora, M. Y.*, Speck, A.K.,
    American Astronomical Society Meeting 203, Atlanta, GA, January 2004 #137.02
32. Observational Evidence for Presolar Grains around Oxygen-rich Evolved Stars - ORAL
    Speck, A.K., Hofmeister, A. M., Mora, M.*
    Workshop on Cometary Dust in Astrophysics, Mt Rainier, WA, August 2003
33. Absorption and reflection IR spectra of MgO and other diatomic compounds. - POSTER
    Hofmeister, A. M., Speck, A.K.
    Astrophysics of Dust Conference, Estes Park, CO, May 2003
34. Episodic Mass Loss on the Timescale of Thermal Pulses: Submillimeter Observations of Dust Shells. - POSTER
    Speck, Angela, Lis, Darek, Meixner, Margaret, Knapp, Gillian
    Astrophysics of Dust Conference, Estes Park, CO, May 2003
35. Episodic Mass Loss on the Timescale of Thermal Pulses: Radiative Transfer Modeling - POSTER
    Speck, Angela, Nenkova, Maia, Meixner, Margaret, Elitzur, Moshe, Knapp, Gillian
    Astrophysics of Dust Conference, Estes Park, CO, May 2003
36. The Dust Ring of LBV Candidate HD 168625 - POSTER
    O'Hara, T.B., Meixner, M., Speck, A.K., Ueta, T., Bobrowsky, M.
    American Astronomical Society Meeting 201, Seattle, WA, January 2003
37. Near-IR and BIMA CO Observations of the Red Rectangle - POSTER
    Doering, R., Meixner, M., Fong, D., Zalucha, A., Maxham, A., Speck, A.K.
    American Astronomical Society Meeting 201, Seattle, WA, January 2003
38. Periodic Enhancements in Mass Loss on the AGB: Radiative transfer modeling of the parsec-sized dust shell around the Egg Nebula - POSTER
    Speck, A.K.,, Meixner, M., Nenkova, M. & Elitzur, M.,
    "Workshop on Mass-losing Pulsating Stars and their Circumstellar Matter, Sendai Japan, May 2002.
39. Processing of Presolar Grains Around Post-AGB Stars: Silicon Carbide as the Carrier of the 21μm Feature - ORAL
    Speck, A.K., & Hofmeister, A.M.,
    Lunar & Planetary Science Conference, Houston, 33, #1155, March 2002.
40. Formation of Presolar Crystalline Silicates: The Effect of ^{26}Al - ORAL
    Speck, A.K.,, Kemper, F., Whittington, A.G., Molster, F.J. & Herwig, F.,
    Lunar & Planetary Science Conference, Houston, 33, #1155, March 2002.
41. Large-scale extended emission around the Helix Nebula - ORAL
    Speck, A.K. Meixner, M., Fong, D. McCullough, P.R., Moser, D.E. & Ueta, T.
    American Astronomical Society Meeting 199, Washington DC, January 2002
42. Dust around oxygen-rich evolved stars – ORAL
    Speck, A.K., Hofmeister, A.M., Barlow, M.J. & Sylvester, R.J.
    Workshop on Interstellar Silicates, Leiden, The Netherlands, April 2001,

43. Observations of Circumstellar Dust Shells Around Proto-Planetary Nebulae - POSTER
Meixner, M, Speck, A.K., Ueta, T., Knapp, G., Hoffmann, W., Hinz, P.M., Hora, J., Fazio, G., Deutsch, L.
American Astronomical Society Meeting 197, #06.13

44. Infrared Studies of Silicon Carbide - POSTER,
Speck, A.K., & Hofmeister, A.M.
at 63rd Annual Meeting of the Meteoritical Society: Chicago, IL, August 28 - September 1, 2000:

45. Observational Evidence for Presolar Grains around Oxygen-rich Evolved Stars - ORAL ,
Speck, A.K., Hofmeister, A.M. Barlow, M.J. & Sylvester, R.J.,
at 63rd Annual Meeting of the Meteoritical Society: Chicago, IL, August 28 - September 1, 2000

46. Silicon Dioxide in the Infrared Spectra of Oxygen-rich Evolved Stars - POSTER,
Speck, A.K., Barlow, M.J., & Sylvester, R.J.,
at Astrochemistry: From Molecular Clouds to Planetary Systems, IAU Symposium 197, Cheju Island, South Korea, Aug 23-27, 1999

47. Resolution of the SiC problem: astronomical and meteoritic evidence reconciled - POSTER
Speck, A.K., Hofmeister, A.M., & Barlow, M.J.,
at Asymptotic Giant Branch Stars, IAU Symposium 191 Poster Session, #P3-21, held in Montpellier, France, Aug 28 – Sept 1, 1998

48. Silicon Carbide: astronomical and meteoritic evidence reconciled – POSTER
Speck, A.K., Hofmeister, A.M., & Barlow, M.J.,
at the Faraday Discussion no. 109: Chemistry and Physics of Molecules and Grains in Space, The University of Nottingham, UK, 15-17 April 1998. - *joint winner of the Skinner Poster Prize.*

49. Silicon Carbide absorption features in the outflows of carbon stars - POSTER
Speck, A.K., & Barlow, M.J.,
at the "Conference on the Astrophysical Implications of the Laboratory Study of Presolar Materials", Washington University, St Louis, MO, October 1996

50. Observations of the 11 micron Silicon Carbide Feature in Carbon Star Shells - POSTER
Speck, A.K., Barlow, M.J., & Skinner, C.J.
at the IAU Symposium 177 "The Carbon Star Phenomenon", Antalya, Turkey, May 1996.

51. Digital elevation models of the North Polar regions of Mars - POSTER,
Speck, A.K., Murray, J.B., & Rothery, D.A.,
1995, *L.P.S.C.*, 26, 1017.
(I was involved in this work after the abstract was submitted - my name does not appear on this abstract - but it did appear on the poster - the other authors can confirm my involvement in this work.)

Conferences attended:

Conference	*Venue*	*presentation*
IAU Symposium 177: The Carbon Star Phenomenon	Antalya (Turkey) 1996	poster
From Stardust to Planetesimals	California (USA) 1996	poster
Astrophys. Implications of the Lab Study of Presolar Grains	St. Louis (U.S.A.) 1996	poster[a]
Dust & Molecules in Evolved Stars	Manchester (UK) 1997	oral
The 60th Meteoritical Society Conference	Hawaii (USA) 1997	--

Chemistry & Physics of Molecules and Grains in Space	Nottingham (UK) 1998	poster[b]
IAU Symposium 191 - AGB Stars	Montpellier (France) 1998	poster[c]
Thermal Emission Spectroscopy of Dust, Disks & Regoliths	Houston (USA) 1999	oral
IAU Symposium 197 - Astrochemistry	South Korea 1999	poster[c,d]
ISO Beyond point sources	Madrid (Spain) 1999	oral
Presolar Grains etc	St. Louis (U.S.A.) 1999	oral
4th Tetons NASA Conference	Wyoming (U.S.A.) 2000	posters
Protoplanetary Nebulae	Torun (Poland) 2000	oral
The 63rd Meteoritical Society Conference	Chicago, Illinois (U.S.A.) 2000	oral & poster
ISOPHOT Workshop on PHT32 Oversampled Mapping	Madrid (Spain) 2001	oral
Origin and Evolution of Interstellar Silicates	Leiden (The Netherlands) 2001	oral[e,f,h]
Workshop on Presolar Grains	St. Louis (U.S.A.) 2001	oral
IAU Symposium 209 - Planetary Nebulae	Canberra (Australia) 2001	poster (x3)
AAS meeting	Washington, DC (U.S.A.) 2002	oral
Lunar & Planetary Science Conference	Houston (U.S.A.) 2002	oral (x2)
Workshop on Pulsating Mass-losing Stars	Sendai (Japan) 2002	poster[f]
Astrophysics of Dust	Estes Park, CO (U.S.A.) 2003	poster (x3)
Asymmetric Planetary Nebulae III	Mt Rainier, WA (U.S.A.) 2003	oral[h]
Workshop on Cometary Dust in Astrophysics	Mt Rainier, WA (U.S.A.) 2003	oral[h]
Mid-America Regional Astrophysics Conference (MARAC)	Kansas City, MO (U.S.A.) 2003	oral
AAS meeting	Atlanta, GA (U.S.A.) 2004	Poster (x3)
AAS meeting (Winter)	San Diego, CA (U.S.A.) 2005	Poster (x4)
Mid-America Regional Astrophysics Conference (MARAC)	Kansas City, MO (U.S.A.) 2005	oral[h]
AAS meeting (Summer)	Minneapolis, MN (U.S.A), 2005	oral & poster (x4)[h]
Astronomy with Radioactivities V	Clemson, SC (U.S.A), 2005	oral[h]
AAS meeting (Winter)	Washington, DC (U.S.A.) 2006	poster (x8)
IAU Symp. 234: Planetary Nebulae in our Galaxy & Beyond	Waikaloa, HI (U.S.A.) 2006	poster (x3)
Why Galaxies Care About AGB Stars	Vienna (Austria.) 2006	oral & poster (x4)[g]
Asymmetric Planetary Nebulae 4	La Palma (Canary Is.) 2007	poster (x2)

[a]Funds to attend awarded by Washington University
[b] Winner of the Skinner Poster Prize
[c]Funds to attend awarded by the IAU
[d]Funds to attend awarded by the Royal Society
[e]Funds to attend awarded by workshop organizers
[f]Funds to attend awarded by AAS
[g]Funds to attend awarded by University of Missouri - Columbia's Faculty International Travel Grants
[h]Invited talk