CV Dr. Michael Winter

Assistant Professor, Dep. of Mechanical Engineering, University of Kentucky, 185 Ralph G. Anderson Building, Lexington, KY 40506-0503. *Status:* U.S. Permanent Resident.
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Education and Training

2006	Dissertation *Emission Spectroscopic Investigation of the Flow Field around a Blunt Body in a High Enthalpy Flow*, Institute of Space Systems, Universität Stuttgart.
1992-1993	Diploma thesis *Investigation on the Receiver design of a Fix-Focus-Concentrator* at the DLR Stuttgart in the branch of solar energy production with the title.
1991	Student thesis *Absorption spectroscopic investigation of a plasma plume fort the simulation of re-entry* at the Institute of Space Systems at the Universität Stuttgart.
1985-1993	Study of *Aerospace Engineering*, University of Stuttgart (undergrad and graduate)
1984-1985	Study of *Mechanical Engineering*, University of Siegen (undergrad)

Research and Professional Experience

Since	Assistant Professor, Department of Mechanical Engineering, University of Kentucky.
08.2012	*Teaching:* Radiation Heat Transfer, Spacecraft Propulsion, Elements of Heta Transfer
	Research: Plasmadiagnostics, Radiation Sciences, Soot Research, Re-entry relted research, Gas Surface Interaction in Plasmas and Flames
2009-12	Research Scientist at NASA Ames Research Center through UARC, UC Santa Cruz, Task Manager *High Enthalpy Environments* (formerly Nano TPS) from January 2010. Optical Plasmadiagnostics at the NASA Ames Arc-jet Facilities, Airborne Observation of the Hayabusa Re- entry, Radiation Modeling (Neqair)
2008	Senior Research Scientist at Laboratoire EM2C, Ecole Centrale Paris. Project Management for ESAprojects, Airborne Observation of the ATV Re-entry
2005-08	Deputy lab manager of the Space Transportation Technology group, Institute of Space Systems, Universität Stuttgart.
Teaching	Plasma Diagnostic Methods, Electric Propulsion, Unconventional Spacecraft Propulsion, Measurement Techniques and Quality Assurance (Hamburger Fernfachhochschule – University of Applied Sciences)
Research	Development and testing of high power self field and medium power applied field MPD thrusters; Plasma diagnostics with probes and optical methods (Langmuir probes, emission spectroscopy, Fabry Perot interferometry, laser based methods Development of flight experiments for atmospheric entries; Theoretical simulation of molecular emission spectra and collisional radaiative models; Airborne Observation Missions: emission spectroscopy measurements, radiation predictions
1993-2005	Scientific collaborator at the Institute of Space Systems, Universität Stuttgart

Synergistic Activities

- Contribution to the graduate aerospace curriculum development at the University of Kentucky by developing a new class on *Spacecraft Propulsion* with emphasis on *Electric Propulsion* (since Spring 2013).
- Active member of AIAA: Non-equilibrium discussion group, Thermophysics Committee, Technical co-chair for AIAA Thermophysics Conference at the Aviation 2016, Co-author of a book to introduce young professionals to diagnostic methods.

Awards

- 2016 Thermophysics Best Paper Award for paper AIAA Paper 2016-1981, “Spectral, Directional Emittance at Elevated Temperatures for Various Materials”.
- NESC Group Achievement Award and NASA Group Achievement Award as member of the Stardust Hypervelocity Entry Observing Campaign Team.
- NASA Ames and NASA Honor Group Achievement Awards to the Hayabusa Re-entry Airborne Observation Team.

Selection of Most Relevant Publications

1. Michael Winter, Robert Bickel, Dusan P. Sekulic, Helmut Koch, Hai Fu, Bradley Butler, *Spectral, Directional Emittance at Elevated Temperatures for Various Materials*, proceedings of the AIAA Aviation 2016, Thermophysics Conference, San Diego, CA 04 – 08 Jan 2016, *awarded 2016 Thermophysics Best Paper*.
2. Michael W. Winter, George Raiche, Dinesh K. Prabhu, *Emission Spectroscopy and Radiometry Measurements in the NASA Ames IHF Arc Jet Facility*, 5th ESA-CNES RHTG workshop in Barcelona, Spain, Oct. 2012 (invited paper).
3. Bradley D. Butler, Michael Winter, Francesco Panerai, Alexandre Martin, Sean C.C. Bailey, Margaret Stackpoole, Paul Danehy, Scott Splinter, *Characterization of Candidate Materials for Remote Recession Measurements of Ablative Heat Shield Materials*, AIAA SciTech 2016, Thermophysics Conference, San Diego, CA 04 – 08 Jan 2016.
4. Michael W. Winter, Bradley Butler, Paul Danehy, Scott Splinter, *Characterization of Ablation Product Radiation Signatures of PICA and FiberForm in the NASA Langley HYMETS Facility*, AIAA AVIATION 2016, Washington, D.C., 13–17 June 2016. [to be submitted to AIAA Journal of Thermophysics and Heat Transfer]
5. H. Koch, Bradley Butler, Michael W. Winter, Christian Arnold, *Operational Envelope of the Low Power Plasma Facilities at the University of Kentucky*; AIAA AVIATION 2016, Washington, D.C., 13–17 June 2016.
6. Michael W. Winter, Ryan D. McDaniel, Yih-Kanq Chen, David Saunders, P. Jenniskens, *Radiation Modeling for the Reentry of the Hayabusa Sample Return Capsule*, AIAA-2012-1296, 50th AIAA Aerospace Sciences Meeting, Nashville, Tennessee, 9 - 12 Jan 2012,in NASA review for submission to the Journal of Spacecrafts and Rockets.
7. Paul M. Danehy, Brett F. Bathel, Craig T. Johansen, Michael Winter, Sean O'Byrne, Andrew D. Cutler, *Optical Diagnostics for Hypersonic Nonequilibrium Flows*, in *Fundamentals and Recent Advances in Nonequilibrium Hypersonic Flows*, to be published by the American Institute of Aeronautics and Astronautics (AIAA), October 2014.
8. S. Lein, T. Reimer, K. Stubicar, F. Deuble, M. Auweter-Kurtz, G. Herdrich und M. Winter: *Development of the re-entry spectrometer RESPECT for the ESA capsule EXPERT*, in: Acta Astronautica, v. 64, iss. 4, p. 416-426, 2009.
9. Michael W. Winter, Thomas Pfrommer. and Monika Auweter-Kurtz: *Investigation of a Xenon Plasma by Optical Measurements and Electrostatic Probes using a Corona Type Model*, AIAA2006-4822, 42nd Joint Propulsion Conference & Exhibit, Sacramento, CA, July 9-12, 2006
10. Michael Winter, Markus Fertig, Monika Auweter-Kurtz, Chul Park: *Characterization of a Subsonic Re-Entry Plasma by Plasmadiagnostic Measurements and Numerical Simulation of the Boundary Layer Around a Blunt Body*, AIAA-2009-4243, 41st AIAA Thermophysics Conference, San Antonio, Texas, June 22-25, 2009.
11. Michael W. Winter, Cidambi Srinivasan, Richard Charnigo, *Non-Equilibrium Analysis of Emission Spectroscopy Data Taken in the Freestream of the NASA IHF Arc Jet Facility*, AIAA AVIATION 2015, Dallas, Texas, 22 - 26 Jun 2015 [to be submitted to AIAA Journal of Thermophysics and Heat Transfer].
12. Emil Sandoz-Rosado, William Page, David O'Brien, Joshua Przepioski, Dennis Mo, Benjamin Wang, Tam-Triet Ngo-Duc, Jovi Gacusan, Michael W. Winter, M. Meyyappan, Robert D. Cormia, Shuhei Takahashi and Michael M. Oye, *Vertical graphene by plasma-enhanced chemical vapor deposition: Correlation of plasma conditions and growth characteristics*, J. Mater. Res., 17 September 2013.

Graduate and Postdoctoral Advisors

- Prof. Dr.-Ing habil. Monika Auweter-Kurtz, Director German Aerospace Academy ASA, Böblingen, Germany, Main Advisor of Ph.D. thesis (Ph.D. awarded Dec. 2006);

– Prof. Dr. Chul Park, Professor Korean Advanced Institute of Science and Technology – KAIST, Daejeon, South Korea, Co-advisor of Ph.D. thesis (Ph.D. awarded Dec. 2006);

– Prof. Dr. Christophe Laux, Professor at École Centrale Paris, Advisor during 9 month stay as Senior Research Scientist at École Centrale Paris in 2008.

Thesis Advisees (3 PhD, 4 MS)

- PhD candidate Zhaojin Diao, MS Robert Bickel, MS candidate Ricky Green, University of Kentucky;

- PhD candidate Helmut Koch, MS Christian Arnold, MS candidate Julian Beyer, University of Stuttgart, Germany, Research at University of Kentucky;

- PhD candidate Christian Zuber, University of Stuttgart, Research at DLR Stuttgart, Germany;