

Curriculum Vitae  
**MATTHIAS DIETRICH**

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- Work Address** The Ohio State University  
Department of Astronomy  
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- Citizenship** German, Permanent US Resident, Green Card Holder
- Marital status** married
- Education** Graduation as Ph.D. in Physics at the University of Göttingen/Germany  
Grade: magna cum laude  
Ph.D. thesis on “Temporal and Spectral Highly Resolved Variability  
Analysis of NGC 5548”  
adviser Prof. Dr. Klaus J. Fricke  
Graduation as Diplom-Physiker (M.A.) at the University of Göttingen/Germany  
Grade: 1.3 (“very good”)  
Diploma thesis on “2-D Spectrophotometry of Active Galaxies”  
adviser Prof. Dr. Klaus J. Fricke  
Study of physics at the University of Göttingen/Germany
- Awards** For Cycle 15 of Hubble Space Telescope mission my HST proposal GO 10792  
entitled *Quasars at Redshift  $z=6$  and Early Star Formation History* has been  
awarded with 28 orbits to measure near-infrared spectra with a continuous  
wavelength coverage from 0.8 to 2.5 $\mu$ m (grant 100 000 US\$). The observations  
have been successfully completed.

## Academic Positions

since Oct. 2008

**Visiting Assistant Professor at The Ohio State University,  
Department of Astronomy**

Oct. 2004 — Sep. 2008

**Postdoctoral Researcher at The Ohio State University,  
Department of Astronomy**

study of the evolution of the quasar population, i.e. quasar activity and the relation with host galaxy properties, star formation in the early universe, gas chemical composition, estimate of super-massive black hole masses of high redshift quasars, in collaboration with F. Hamann (University of Florida), M. Vestergaard (Tufts University), I. Appenzeller, S.J. Wagner (Landessternwarte Heidelberg, ZAH), J. Kollmeier (The Carnegie Observatories), C. Onken (Herzberg Institute of Astrophysics), S. Mathur, P. Osmer (The Ohio State University), D. Grupe (Penn State University)

variability studies of Seyfert galaxies in the local universe to constrain the size, geometry, and gas kinematics of the broad emission line region, to determine the mass of black holes, and to scrutinize the relation of AGN activity with host galaxy properties, in collaboration with B.M. Peterson, K. Denney (The Ohio State University), M. Bentz (University of California)

investigation of Narrow-Line Seyfert 1 galaxies to determine the EUV continuum strength and shape and the implications on AGN models, in collaboration with D.M. Crenshaw (Georgia State University) and S.B. Kraemer (Catholic University of America, NASA/Goddard Space Flight Center), as well as to study the properties of the ultraviolet-optical-near infrared emission line spectrum to constrain the physical conditions in the immediate vicinity of the central black holes, in collaboration with S. Mathur (The Ohio State University), K.M. Leighly (University of Oklahoma), D. Grupe (Penn State University), S. Komossa (Max - Planck Institute for extraterrestrial Physics)

Oct. 2002 — Sep. 2004

**Postdoctoral Associate at the Georgia State University,  
Department of Physics and Astronomy**

study of the evolution of the quasar population, i.e. quasar activity and the relation with host galaxy properties, star formation in the early universe, gas chemical composition, estimate of super-massive black hole masses of high redshift quasars, in collaboration with F. Hamann (University of Florida), M. Vestergaard (Tufts University), I. Appenzeller, S.J. Wagner (Landessternwarte Heidelberg)

investigation of Narrow-Line Seyfert 1 galaxies emphasizing the determination of the EUV continuum strength and shape and the implications on AGN models, in collaboration with D.M. Crenshaw (Georgia State University) and S.B. Kraemer

(Catholic University of America, NASA/Goddard Space Flight Center)  
study of relations connecting luminosity, continuum spectral energy distribution, and emission line properties, in collaboration with F. Hamann (University of Florida), J. Shields (Ohio University), D.M. Crenshaw (Georgia State University) and S.B. Kraemer (Catholic University of America, NASA/Goddard Space Flight Center)

**Nov.1999 — Sep.2002**

**Postdoctoral Fellow at the University of Florida, Department of Astronomy**

study of the evolution of the quasar population (gas chemical composition, interaction with the host galaxy, star formation history in the early universe), in collaboration with F. Hamann (University of Florida)

investigations of correlations of luminosity and cosmic time with spectral properties, e.g. emission line strength, line profile parameters, continuum SED, in collaboration with F. Hamann (University of Florida), I. Appenzeller (Landessternwarte Heidelberg), and J. Shields (Ohio University)

**Jan.1996 — Sep.1999**

**Research Assistant at the Landessternwarte Heidelberg as a member of the Sonderforschungsbereich 328, Teilprojekt D1 “Active Galaxies”**

study of high redshift quasars regarding their gas metallicity, in collaboration with I. Appenzeller, S.J. Wagner, U. Wilhelm-Erkens (Landessternwarte Heidelberg)  
coordination and analysis of the results of an international monitoring campaign of NGC 5548, in collaboration with C.M. Gaskell (University of Nebraska)

investigation of the dynamics of narrow-line region gas of nearby Seyfert galaxies (e.g., NGC 1068, NGC 1386), in collaboration with S.J. Wagner and J. Rossa (Landessternwarte Heidelberg)

study of broad emission line profiles with respect to possible intrinsic small scale profile shape fluctuations, in collaboration with S.J. Wagner (Landessternwarte Heidelberg) and T.J.-L. Courvoisier (Geneva Observatory)

**Oct.1994 — Dec.1995**

**Research Assistant at the Landessternwarte Heidelberg as a member of the Sonderforschungsbereich 328, Teilprojekt D “Active Galaxies”**

investigation of the dynamics of narrow-line region gas of nearby Seyfert galaxies, in collaboration with S.J. Wagner (Landessternwarte Heidelberg)

studies of the dynamics and structure of the broad-line region, in collaboration with W. Kollatschny (Universitäts-Sternwarte Göttingen)

coordination and analysis of the results of an international monitoring campaign of 3C 390.3, in collaboration with B.M. Peterson (The Ohio State University) and P.T. O’Brien (University of Leicester)

**Aug.1993 — Sep.1994**    **Research Assistant at the Universitäts-Sternwarte Göttingen as a member of the DFG research project “Variability and Kinematics of the Central Broad-Line Region of Active Galaxies”**

continuation of the variability study for a larger sample of Seyfert galaxies, in collaboration with W.Kollatschny (Universitäts-Sternwarte Göttingen) and B.M. Peterson (The Ohio State University)

support and maintenance of the VAX-Cluster at the Universitäts-Sternwarte Göttingen

**Feb.1991 — Jul.1993**    **Research Fellow at the Universitäts-Sternwarte Göttingen as a member of the BMFT research project “Ground-Based Astronomy”**

investigations of the dynamics and structure of the broad-line region of Seyfert galaxies based on correlated emission-line flux and line profile variations, in collaboration with W.Kollatschny (Universitäts-Sternwarte Göttingen) and B.M. Peterson (The Ohio State University)

beginning the project on measuring the chemical composition of gas closely related to quasars at high redshifts, in collaboration with U. Wilhelm-Erkens (Landessternwarte Heidelberg)

## Teaching Philosophy and Teaching Experience

Learning is an active process that requires energy for physical and mental interaction with objects and ideas. My pedagogy provides a framework for a wide range of learning styles to reach academic success while focusing on a specific subject matter, in my instance astronomy. I refer to this as a critical pedagogy and is an explainable function.

First and foremost, the educator should reach the targeted audience and promote positive relationships between teacher and students. By offering a wide variety of differentiated instructions — such as hands-on demonstrations of, e.g. orbits and their physical properties, evening telescope viewing sessions, measuring the mass of the Earth in a classroom experiment, lectures notes which are on-line available, films, and short clips — a larger audience is reached and the goal of every student reaching her or his potential academically is underway.

Creating a sense of wonder and awe in the classroom is a goal that appears daunting, can be thought of as education that motivates and inspires students to become life long learners. One way to achieve this is sharing my research and my passion for astronomy. One useful technique that I have inadvertently stumbled on is leading the students through the thrill of problem solving. By asking such leading questions as ‘if X happens what does this tell you about Y?’, giving them a chance to answer their own questions and showing how scientists think and solve problems. Instead of rote teaching practices, I believe that learning by questioning, sharing knowledge and skills, and by guidance toward the solution in a respectful atmosphere, will result into a habit of critical thinking and staying curious.

Soliciting feedback from the students through out the quarter allows for me to adjust or correct anything which is unclear or needs to be reviewed. Doing this as a weekly ritual rather than waiting for student reviews at the end of a quarter, allows for me to monitor my effectiveness as an instructor. Through my teaching and mentoring of teaching assistants, I strive to teach skills that will hopefully have a lasting impact on their lives.

Since 2005 I have taught several times Introductory Astronomy courses at The Ohio State University. I have used the textbook *Universe* (7<sup>th</sup> edition) by Friedman & Kaufmann as additional reading for the first

Astronomy 161 Introduction to Solar System Astronomy (for non-science majors)

Fall 2005 — about 100 students; Monday through Friday, 1 hour

Fall 2006 — about 100 students; Monday through Friday, 1 hour

Summer 2007 — about 80 students; Tuesday and Thursday, 2 hours

Winter 2008 — about 60 students; Monday through Friday, 1 hour

Winter 2009 — about 100 students; Monday through Friday, 1 hour

Fall 2009 — about 100 students; Monday, Wednesday, Friday, 1.5 hours

Astronomy 162 Introduction to Stellar, Galactic, and Extragalactic Astronomy (for non-science majors)

Spring 2009 — about 80 students; Monday, Wednesday, Friday 1.5 hours

three classes. Beginning with the class in winter 2008 I am using the textbook *21<sup>st</sup> Century Astronomy*, 2<sup>nd</sup> edition, by Hester et al. (2007). In fall 2009 I am teaching Astronomy 161 (Introduction to Solar System Astronomy — for non-science majors).

## **Observing Experience**

I have used ground-based telescopes ranging from 0.7 m to 10.0 m with a large variety of instruments in more than 50 observing runs at Calar Alto Observatory in Spain (1.23 m, 2.2 m, 3.5 m), ESO in Chile at La Silla (1.5 m ESO, 1.5 m Danish, 3.5 m NTT) and at Paranal (8 m VLT, UT1 and UT2), CTIO in Chile (0.9 m SMARTS, 1.5 m, 4 m), Kitt Peak National Observatory in Arizona (2.1 m, 4 m), McDonald Observatory in Texas (0.9 m, 2.1 m, 2.7 m), the University of Michigan – Dartmouth College – M.I.T. (MDM) Observatory in Arizona (1.3 m, 2.4 m), on Mauna Kea, Hawaii (Keck 10 m, Gemini N 8 m, IRTF 3 m), and Landessternwarte Heidelberg (0.7 m). I have used NICMOS aboard HST to study the rest-frame UV spectrum of quasars at redshift  $z \simeq 6$  (GO 10792). In addition, I am experienced using data archives like SDSS, 2 MASS and those of space missions e.g., HST, FUSE, IUE, Spitzer.

I have done spatially resolved long-slit spectroscopy at moderate and high spectral resolution in the ultraviolet, optical and near-infrared wavelength range, echelle spectroscopy, fiber-fed echelle spectroscopy, and Coudé spectroscopy, as well as polarimetric and spectropolarimetric observations.

## **Further Skills**

At the Landessternwarte Heidelberg, I was operating and was responsible for the maintenance of the 0.7 m telescope. I was testing the capabilities and performance of CCD-camera systems and supported the development of a CCD-camera user environment. Furthermore, I have trained more than a dozen of students to conduct astronomical research, to learn how to operate small to mid-size telescopes at Calar Alto Observatory, CTIO, KPNO, and MDM observatory, and how to reduce and to analyze photometric and spectroscopic data. I am also very familiar operating telescopes up to 12 inch in a manual mode.

I have developed programs for time series analysis, emission-line profile studies based on Monte-Carlo simulations, and spectral multi-component analysis using emission template spectra to deconvolve quasar spectra, e.g., to determine the host galaxy contribution to the observed spectrum.

Furthermore, I am familiar with variability statistics (auto- and cross-correlation analysis, reverberation mapping, calculating the 1D and 2D response functions).

I am using MIDAS (expert level), IRAF (basic level), FORTRAN (expert level), UNIX (expert level), VMS (expert level), and MS-DOS (basic level) for my research.

## Services

Since 1995 I am serving as a referee for more than 30 publications in the *Astrophysical Journal*, the *Astronomical Journal*, *Astronomy & Astrophysics*, *Monthly Notices of the Royal Astronomical Society*, *Astrophysics and Space Science*, and *Publications of the Astronomical Society of Japan*.

I was a member of the Scientific Organizing Committee for the conference *Structure and Kinematics of Quasar Broad-Line Regions* held in Lincoln, Nebraska in March 1998, and co-editor of the conference proceedings.

I was a member of the Local Organizing Committee of the International Meeting of the German Astronomical Society (AG) on *Astronomische Instrumente und Methoden zu Beginn des 21. Jahrhunderts* held at Heidelberg in September 1998.

In Fall 2007, I served as a reviewer for the GALEX Cycle 4 Guest Investigator program.

In 1998, I organized, coordinated, analyzed, and published the results of a short-term monitoring campaign on the Seyfert 1 galaxy NGC 5548.

I coordinated the world-wide optical monitoring campaign of 3C 390.3 in 1995 within the multi-wavelength campaign performed by the international AGN watch consortium.

At the Department of Astronomy of the Ohio State University, at the Physics and Astronomy Department of the Georgia State University, at the Department of Astronomy of the University of Florida, at the Landessternwarte Heidelberg, and at the Universitäts-Sternwarte Göttingen, I am involved in supervising summer students, undergraduate students, and graduate students as Co-adviser.

Currently, Mr. Steve Poorman, an undergraduate student at OSU, is working on the variability of the Seyfert galaxy NGC 5548. Goal of this study is to estimate the mass of the central black hole of this AGN and to test the general assumption of a virial theorem for this method. Hence, we are studying several broad emission lines in the optical ( $H\alpha$ ,  $H\beta$ ,  $H\gamma$ , He I 5876, He II 4686) which has been done so far only for a handful of objects. A publication of the results of this project is in preparation.

At the Department of Astronomy of The Ohio State University I am a co-organizer of the weekly AGN-Lunch.

At the Department of Astronomy of the University of Florida, I organized a weekly journal club meeting where undergraduate and graduate students, post-docs, and faculty members report about recent publications, ongoing research projects, conferences, and the development of new instrumentation.

At the Department of Astronomy of the Ohio State University, at the Department of Astronomy of the University of Florida, and at the Landessternwarte Heidelberg, I am involved in out-reach activities like public lectures and public observations of the night sky.

## **Public Outreach**

Over the years, I have started and have been involved in public outreach events like seminars, star parties, public talks, and planetarium shows using the planetarium here on campus of The Ohio State University. Currently, I am offering a quarterly star party for the community of Groveport, Ohio. Through this event I have also participated at the '100 Hours of Astronomy' in early April 2009, a global star party initiated by the 'International Year of Astronomy 2009'.

## **Memberships in Honor Societies**

International Astronomical Union (IAU)	since 1997
American Astronomical Society (AAS)	since 2000
German Astronomical Society (AG)	since 1987
Deutsche Physikalische Gesellschaft (DPG)	since 1988
Förderkreis der Landessternwarte/Observatory Königstuhl, Heidelberg	since 1998

## **Languages**

German	native speaker, fluent
English	fluent
Latin	rusty

## **Personal Interests**

long distance running  
soccer  
photography  
wildlife conservation (WWF)  
History