Dirk Petry

Physicist/Astrophysicist

Code 661
Laboratory for High Energy Astrophysics
NASA/Goddard Space Flight Center
Greenbelt, MD 20771

Education

Diplom (M.Sc.)	(Physics)	Albert-Ludwigs-Universität, Freiburg i.Br., Germany, February 1994
Dr. rer.nat. (Ph.D.)	(Physics)	Technische Universität München, Germany, February 1998

Theses

Ph.D. Thesis (1997):
"Beobachtung hochenergetischer Gamma-Strahlung aus Richtung der aktiven Galaxien Mkn 421 and Mkn 501"
("Observation of high-energy gamma-radiation from the direction of the active galaxies Mkn 421 and Mkn 501")

Contains a general introduction to high-energy gamma-astronomy and the imaging Cherenkov telescope technology.
download ps-file

Diploma Thesis (1993):
"Cluster-Erkennung für den OPAL Microvertex Detektor"
("Cluster-recognition for the OPAL Microvertex Detector")

Contains a general introduction to silicon strip detectors and their application in microvertex detectors.
download ps-file

Professional Appointments

Present position: Assistant Researcher, Joint Center for Astrophysics, University of Maryland Baltimore County and the Laboratory for High-Energy Astrophysics at NASA/Goddard Space Flight Center

July 2000 - August 2002: Postdoctoral Researcher, VERITAS project, Dept. of Physics, Iowa State University, USA

July 1998 - June 2000: Postdoctoral Researcher, MAGICT project, Institute for High Energy Physics, Universitat Autonoma de Barcelona, Spain

September 1997 - June 1998: Postdoctoral Researcher, HEGRA project, Dept. of Physics, Bergische Universität, Wuppertal, Germany

April 1994 - August 1997: Graduate Research Assistant, HEGRA project, Max Planck Institut für Physik, München, Germany

October 1992 - February 1994: Research Assistant, OPAL project, Institute of Physics, Albert-Ludwigs-Universität, Freiburg i.Br., Germany

Professional Society Memberships

Deutsche Physikalische Gesellschaft

Experience

Research

I am working as a scientific member of the GLAST Science Support Center which will operate during the entire GLAST mission. I have mostly worked in observational gamma-ray astronomy but I have also experience with silicon strip detectors in a particle physics research environment (my Diploma thesis) and with time-of-flight mass spectrometers in a molecular physics environment (C_{60} research during an internship at Freiburg).

I am a German citizen and have studied Physics at Frankfurt, St. Andrews, Heidelberg, and Freiburg. I earned my Diploma (Master) in Physics

working on the readout of the OPAL microvertex detector [1]. Changing over to astrophysics by joining the HEGRA group at the Max Planck Institute for Physics, Munich, I obtained my PhD in Physics from the Technical University of Munich in February 1998 for working on the confirmatory detections of Mkn 421 and Mkn 501 [2, 3] with the HEGRA groundbased Cherenkov telescopes.

As a postdoc, I continued working on Cherenkov telescope data with HEGRA until middle of 1998 helping to evaluate the wealth of data obtained from the 1997 high state of Mkn 501 [4, 5, 6]. Then I concentrated for two years mostly on the technical development of the Major Atmospheric Gamma-ray Imaging Cherenkov (MAGIC) Telescope [7] as the coordinator of the software development, however, also continuing to work on data analysis [8]. Since the MAGIC Telescope project was strongly delayed due to funding uncertainties, I decided to join the VERITAS collaboration [12] on another postdoc postion in 2000 where I worked on hardware development for the VERITAS photomultiplier cameras and on data analysis [11, 13, 9, 10]. On 6 April 2004, the result of my work on VERITAS hardware and readout software, the Fast Low-Cost Many-Sensor Readout System, was awarded US Patent #6717541.

Since September 2002 I am assistant researcher at the NASA/UMBC Joint Center for Astrophysics. In my 30% research time, I am continuing to work on Cherenkov telescope data and technology [14] and other gamma-ray astronomical projects such as analysis of the Earth's gamma-ray emission using archival data from the EGRET instrument onboard the CGRO satellite [15].

Teaching and educational outreach

I am member of the "Ask a high-energy astronomer" educational outreach program.

At Iowa State University I tought the graduate course Meteorology 542 ("Atmospheric Physics", mostly radiative transfer, very mathematical) and recitations and labs for Physics 202.

IT skills

Operating systems: Broad experience with UNIX operating systems (HP-UX, Ultrix, DEC-OSF, Linux) at the system-management level; work-

ing experience with Microsoft operating systems (MS-DOS, Windows 98, NT, 2000, XP); some experience with Apple Macintosh OS; some experience with the OS-9 real-time OS and with VMS.
At Iowa State University I installed, configured, and operated the Beowulf cluster OSLAF using Scyld Linux.

Programming: Programming computers since 1980 using (in chronological order) BASIC, Assembler for the 6502, Pascal, Modula, FORTRAN77, Assembler for the Motorola DSP 56000, C, C++; main software projects: (a) the online data-reduction for the OPAL microvertex detector, (b) the HEGRA Cherenkov telescope data analysis suite, (c) the MAGIC Telescope control system, (d) the data readout and display package for the VERITAS current monitor (using Qt), (e) parts of the GLAST standard analysis environment(in progress). Experience with CVS, make, and CMT.

Data analysis: Strong experience with the PAW package and its successor ROOT. Some experience with Mathematica and IDL.

Website development: Designed and supervised implementation of the GLAST Science Support Center website. Good knowledge of HTML. Experience with XML (Xerxes, Qt).

Word processing: Strong experience using MS Word (used to have a company for IT book translation together with my brother; between 1984 and 89 we translated/edited and typeset 13 books for several german publishers: Moderne Verlagsgesellschaft 84, 84, 84, 85, 85, 85, 85, 86, Vieweg Verlag 85, 86, 87, 89, 89); broad experience with the LaTeX typesetting system.

Other: Experience with Excel, PowerPoint, MS Project, dBaseIV, MySQL.

Languages

German - mother tongue

English - very good, Cambridge Certificate of Proficiency (1992), lived total of 5 years in English speaking countries

Spanish - fair, lived for two years in Spain

French - fair, 4 years at school

Complete publication list

Up-to-date list of my refereed astrophysical publications
Up-to-date list of all my other astrophysical publications

Selected publications

[1] Allport, P. P., ..., Petry, D., et al., 1994, "The OPAL silicon strip microvertex detector with two coordinate readout", NIM A, 346, 476

[2] Petry, D., Bradbury, S.M., Konopelko, A., et al., 1996, "Detection of VHE gamma-rays from Mkn 421 with the HEGRA Cherenkov telescopes", A&A, 311, L13, astro-ph/9606159

[3] Bradbury, S.M., Deckers, T., Petry, D., et al., 1997, "Detection of gamma-rays above 1.5 TeV from Mkn 501", A&A, 320, L5, astro-ph/9612058

[4] Breslin, A.C., ..., Petry, D., et al., 1997, "Detection of VHE gamma-rays from Mkn 501 in a high state", IAU Circular 6592

[5] Aharonian, F., ..., Petry, D., et al., 1999, "The temporal characteristics of the TeV Gamma emission from Mkn 501 in 1997 as observed by the HEGRA Cherenkov telescopes - Part I", A&A, 342, 69, astro-ph/9808296

[6] Aharonian, F., ..., Petry, D., et al., 1999, "The temporal characteristics of the TeV Gamma emission from Mkn 501 in 1997 as observed by the HEGRA Cherenkov telescopes - Part II", A&A, 349, 29, astro-ph/9901284

[7] Petry, D., et al., 1999, "The MAGIC Telescope - Prospects for Gamma Ray Burst research", A&AS, 138, 3, astro-ph/9904178

[8] Petry, D., Böttcher, M., Connaughton, V., et al., 2000, "Multiwavelength observations of Mkn 501 during the 1997 high state", ApJ, 536, 742, astro-ph/0002255

[9] Petry, D., 2001, "A first EGRET-UNID-related agenda for the next-generation Cherenkov telescopes", in Carraminana, A., Reimer, O. & Thompson, D. (eds.), "The nature of unidentified high-energy γ-ray sources", Astrophysics and Space Science Library (Kluwer), vol. 267, p. 299, astro-ph/0101496

[10] Petry, D., & Reimer, O., 2001, "An observability study for the tentatively identified 3EG sources likely to be detected by the next-generation Cherenkov telescopes", in Gehrels, N., et al. (eds.), Proc. "Gamma-Ray Astrophysics 2001", AIP proceedings, astro-ph/0106142

[11] Krennrich, F., ..., Petry, D., et al., 2001, "A cutoff in the TeV spectrum of Mkn 421", ApJ, 560, L45, astro-ph/0107113

[12] Weekes T. C., ..., Petry, D., et al., 2002, "VERITAS: The Very Energetic Radiation Imaging Telescope Array System", Astropart. Phys., 17, 221, astro-ph/0108478

[13] Petry, D., et al., 2002, "The TeV spectrum of H1426+428", ApJ, 580, 104, astro-ph/0207506

[14] Petry, D., 2003, "Faster Background Determintation - a method for gaining time coverage and flux measurement accuracy with present Cherenkov telescopes", Astropart. Phys., 20, 45, astro-ph/0304506

[15] Petry, D., 2004, "The Earth's Gamma-ray Albedo as observed by EGRET", in Völk, H., et al. (eds.), Proc. "High Energy Gamma-ray Astronomy 2004", AIP Proceedings Series, astro-ph/0410487