

BRIEF CURRICULUM VITAE

Name: Dr. Charles E. Woodward
Title: Professor of Physics and Astronomy, Department of Astronomy
Address: School of Physics and Astronomy, 116 Church Street SE, Minneapolis, MN 55455
Phone: 612-624-0254 Fax: 612-626-2029
E-mail: chelsea@astro.umn.edu
Web Page: <http://webusers.astro.umn.edu/~chelsea/>

Expertise: Woodward is an international expert in XUVOIR ground and space-based observational astrophysics, instrumentation development, and telescope construction, management, and operations. He also has significant experience in national space policy. His primary research is on the physical properties of astrophysical grains in interstellar, circumstellar, and solar system environments, the physics of nova explosions and their chemical contributions to the interstellar medium, the physical characteristics of the circumstellar ejecta of evolved stars, evolved stellar population demographics, and the infrared activity of comet nuclei and small solar system bodies.

CURRICULUM VITAE

A.B. (Major in Physics), Dartmouth College, 1980; M.A. (Physics), University of Rochester, 1982; Ph.D. (Physics and Astronomy), University of Rochester, 1987; Research Associate, University of Wyoming 1987-1990, Staff Scientist, Mission Research Corp., 1990-1991, Smithsonian Faculty Fellow, 1991-1992; Assistant Professor, 1991-1995, Associate Professor 1995-2000, University of Wyoming; Director, Wyoming Infrared and Red Buttes Observatories, University of Wyoming, 1996-1999; Associate Professor Of Physics And Astronomy, 2000-2004, Professor Of Physics And Astronomy, 2005-; LBT/SO Program Coordinator, 2006-, University Of Minnesota; NSF Young Investigator, 1993-1994, NSF Presidential Faculty Fellow, 1994-1999; Chair, International Gemini Observatory Board of Directors, 2008-2010; Member, National Academy Sci., Space Studies Board, 2007-2011; Member, OIR Panel Ast2010 Decadal Committee, 2008-2010; Councilor, American Astronomical Society, 2008-; Member, Astronomy Astrophysics Advisory Committee (FACA Cmte.) 2009 -.

STATEMENT OF ACCOMPLISHMENTS

Woodward's involvement with the construction of one of the first astronomical IR array cameras led to the first high spatial resolution flux maps of the unidentified dust emission features (i.e., PAHs) in a range of objects from planetary nebulae such as NGC 7027, to star formation regions like the M8 Hourglass and Orion. These observations provided insight into the excitation environment and survivability of the carriers of this feature. Woodward and collaborators produced one of the first IR scanning Fabry-Perot etalon imaging systems, enabling detailed studies of star formation and supernovae in M82 and other local galaxies. Woodward contributes to the XUVOIR study of classical novae and cataclysmic variable stars, primarily through IR spectroscopic techniques and photoionization modeling to construct detailed abundance analyses of the ejecta and the impact these outflows have on local ISM enrichment. Woodward and Schwarz, using Spitzer data, have demonstrated that the ONe taxonomy historically used to identify high mass WDs requires revision. Leading efforts to understand the dust mineralogy in comet nuclei and coma through IR remote sensing techniques, Woodward contributed to the discovery of rare, Mg-rich crystalline silicate dust species present in select comets. Detection of this material, combined with measurements of the volatile and organic content has resulted in a new paradigm for the early evolution of the solar system. Woodward played a significant role in the programmatic development of the NASA's Space Infrared Telescope Facility (Spitzer) legacy sciences opportunities, and has participated in mentoring programs to enhance diversity in the field of astrophysics.

PRINCIPAL CONTRIBUTIONS TO ASTROPHYSICS

- 1989 **C.E. Woodward**, J.L. Pipher, M.A. Shure, W.J. Forrest, and K. Sellgren, "*Spectrophotometric Images of NGC 7027 in the 3 micron Dust Emission Features*," *Astrophysical J.*, **342**, 860.
- 1996 T.R. Geballe, S.R. Kulkarni, **C.E. Woodward**, and G.L. Sloan, "*The Near Infrared Spectrum of the Brown Dwarf Gliese 229B*," *Astrophysical J.*, **467**, L101.
- 1997 R.J. Rudy, **C.E. Woodward**, T. Hodge, S.W. Fairfield, and D.E. Harker, "*The Peculiar Colours of the Halo Light in the Edge-on Spiral Galaxy NGC 5907*," *Nature*, **387** (No. 6621), 159.
- 1999 D.H. Wooden, D.E. Harker, **C.E. Woodward**, H.M. Butner, C. Koike, F.C. Witteborn, and C.W. McMurtry, "*Silicate Mineralogy of the Dust in the Inner Coma of Comet C/1995~O1 (Hale-Bopp) Pre- and Post-Perihelion*," *Astrophysical J.*, **517**, 1034.
- 2005 D.E. Harker, **C.E. Woodward**, and D.H. Wooden, "*The Dust Grains from 9PTempel 1 Before and After*

the Encounter with Deep Impact,” Science, **310**, 278.

SELECT RECENT PUBLICATIONS

- 2011 **C.E. Woodward**, T.J. Jones, B. Brown, E.L. Ryan, M. Krejny, L. Kolokolova, M.S. Kelley, D.E. Harker, and M.L. Sitko. “*Dust in Comet C/2007 N3 (Lulin)*,” *Astronomical J.*, (in press).
- 2011 **C.E. Woodward** and S. Starrfield. “*Recent Observational and Theoretical Studies of the Classical Nova Outburst*,” *Canadian J. Physics*, **89**, (in press).
- 2011 D.E. Harker, **C.E. Woodward**, M.S. Kelley, M.L. Sitko, D.H. Wooden, R.W. Russell, and D.L. Lynch. “*Mid-Infrared Spectrophotometric Observations of Fragments B and C of Comet 73P/Schwassmann-Wachman 3*,” *Astronomical J.*, **141**, 26.
- 2010 E.M. McLinden, S.L. Finkelstein, J.E. Rhoads, S. Malhotra, P. Hibon, M.L.A. Richardson, G. Cresci, A. Quirrenbach, A. Pasquali, F. Bian, X. Fan, and **C.E. Woodward**. “*First spectroscopic measurements of [OIII] emission from Lyman-alpha selected galaxies at z~3.1*,” *Astrophysical J.*, **730**, 136
- 2010 E.L. Ryan and **C.E. Woodward**. “*Rectified Asteroid Albedos and Diameters from IRAS and MSX Photometry Catalogs*,” *Astronomical J.*, **140**, 933
- 2010 E. Dwek, R.G. Arendt, P. Bouchet, D.N. Burrows, P. Challis, I.J. Danzinger, J.M. DeBuizer, R.D. Gehrz, S. Park, E.F. Polomski, J.D. Slavin, and **C.E. Woodward**. “*Five Years of Mid-Infrared Evolution of the Remnant of SN 1987A: The Encounter between the Blast Wave and the Dusty Equatorial Ring*,” *Astrophysical J.*, **722**, 425

SYNERGISTIC ACTIVITIES

Member, Advisory Review Panel, NSF REU Astronomy Sites, 1993; Chair, ToO Group, NASA Space Infrared Telescope (SIRTF) Community Working Group, 1994-1998; Member, Cmte of Visitors, NSF, Astronomy Directorate, 1995; Chair, Gemini Thermal Infrared Imaging Camera (T-ReCS) Instrument Review Panel, US Gemini Project Office 1996-1998; Member, NASA Next Generation Space Telescope (JWST) Instrument Conceptual Design Review Panel, 1997-1998; Member, NAO/SCOPE Users Cmte., 1998-2001; Member, NASA SIRTF Science Users Cmte. 1998-2002; Chair, Gemini Near-Infrared Coronagraphic Imager (NICI) Instrument Review Panel, US Gemini Project Office, 1999-2002; Chair, NASA SIRTF Science Users Cmte., 2001; Member, National Optical Astronomical Observatories (NOAO) GSMT Science Working Group, 2002-2003; Member, Science Advisory Cmte., US Gemini National Science Office, 1996-2005; Member, International Gemini Science Cmte. (U.S. Representative), 1999-2007; Chair, NOAO Users Cmte., 2000-2003; Chair, American Astronomical Society (AAS) Cmte. on the Status of Minorities in Astronomy, 2000-2004; Member, National Academies of Science (NAS), Terrestrial Planet Finder Science Review (Freedman Report), 2004; Member, NAS Cmte. on Astronomy and Astrophysics (CAA), 2002-2005; Board Member (U.S. Representative), International Gemini Observatory, 2002-2007; Member, Gemini Aspen Instrument Conceptual Design Selection Board, 2004; Program Coordinator, U. Minnesota Large Binocular Telescope Partnership, 2006-; Member, Large Binocular Telescope Science Advisory Cmte., 2004-; Member, Cmte of Visitors, NSF, Astronomy Directorate, 2005; Member, NAS Committee to Assess Progress to the Decadal Vision in Astronomy and Astrophysics (Urry Report), 2005; Member, NAS NASA Astrophysics Performance Assessment Cmte. (Keller Report), 2006-2007; Member, Subaru Observatory (Japan) Time Allocation Cmte., 2006-2009; Member, NAS Science Space Studies Board (SSB), 2007-2011; Board Chair, International Gemini Observatory, 2008-2010; American Astronomical Society (AAS) Councilor 2008-; Member, OIR Panel Ast2010 Decadal Cmte., 2008-2010; Member NSF Committee of Visitors, 2011; Member, Astronomy Astrophysics Advisory Committee (FACA Cmte.) 2009 -.

PH.Ds. OVER THE LAST DECADE

Person	Date	Field	Current Employment
James Edward Lyke	2003	Astrophysics	William Keck Observatory
Edward Rhodes	2005	Astrophysics	Indiana U. Purdue, IUPUI
Michael S. Kelley	2006	Astrophysics	Univ. Maryland
Gerald Ruch	2008	Astrophysics	Univ. St. Thomas
Martha L. Boyer	2008	Astrophysics	Space Telescope Sci. Inst.
Tea Temim	2009	Astrophysics	NASA Goddard
L. Andrew Helton	2010	Astrophysics	SOFIA Science Center
Erin Lee Ryan	2011	Astrophysics	U. Virginia