

MICHAEL W. CASTELAZ

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Biographical: <http://campus.pari.edu/mwc/>
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Degree: Ph.D. University of Wyoming, Laramie, WY 82071
Sept. 1984 (Physics - Dr. John Hackwell, Advisor)
Thesis: "The Nature and Geometry of Infrared Reflection Nebulae"

Degree: Master of Science, Central Michigan University, Mount Pleasant, MI 48859
May 1979 (Physics - Dr. Wayne Osborn, Advisor)
Thesis: "Photoelectric UBV Light Curves of BX Andromedae"

Degree: Bachelor of Science University of Wisconsin, Stevens Point, Stevens Point, WI
54481, May 1977 (Physics - Dr. Francis Schmitz, Advisor)

EMPLOYMENT HISTORY

2003- Research Associate Professor, Physics, UNC-Asheville
2001- Director of Astronomical Studies and Education, Pisgah Astronomical
Research Institute
1998- Co-Editor, International Amateur-Professional Photoelectric Photometry
Communications
1996-2001 Associate Professor, East Tennessee State University
1993-1999 Observatory Director, Southeastern Association for Research in Astronomy
1991-1996 Assistant Professor, East Tennessee State University
1986-1991 Research Associate Professor, Allegheny Observatory of the University of
Pittsburgh
1990-1991 Senior Lecturer in Astronomy, Carnegie-Mellon University, Department of Physics
1984-1986 National Academy of Sciences NRC Research Associate, NASA Ames Research
Center
1979-1984 Graduate Assistant, University of Wyoming, Wyoming Infrared Observatory
1977-1979 Graduate Assistant, Central Michigan University
1978 Data Analyst, Lunar and Planetary Laboratory, Dept. of Planetary Science,
University of Arizona

PRIMARY SKILLS

- Management and Project Director experience
- Successful grant and funding proposal writing experience
- College and high school classroom and mentoring experience
- Experience in the field of visualization of science concepts
- Instrument (astronomical) remote control hardware and software development
- Basic Research

RESEARCH & TEACHING EXPERIENCE

AT PISGAH ASTRONOMICAL RESEARCH INSTITUTE (www.pari.edu)

Duties include development and management of new science research and education programs through collaborations with colleges and universities and high schools, fund raising to support these programs, teaching high school and undergraduate special courses, and instrument development particularly related to remote control and visualization of science.

Some examples –

- Created the School of Galactic Radio Astronomy (<http://campus.pari.edu/tw/SGRA/sgra.html>), a project for high school science education using remote control of a radio telescope. Funded through grants from NASA Space Telescope Science Institute, Z. Smith Reynolds, Progress Energy
- Created a visualization of science program called “Sensing the Radio Universe” which visualizes in a planetarium the universe as seen by radio telescopes (<http://campus.pari.edu/ipse>). Managed 12 undergraduates and 3 university faculty over the course of 2 years who built the project. Funded through a grant from the National Science Foundation.
- Part of a team of 5 astronomers who used the Hubble Space Telescope to conduct the first, and now only study, of very young stars illuminating their surrounding and forming planetary systems. Papers are in the process of being written. Hubble Space Telescope Cycle 12 Observing Time, “The First Spectroscopic Study of a Unique Set of Young Stars in the Orion Nebula”, HST-GO-09866.03. Co-I with Bruce McCollum (SIRTF Science Center, Caltech), Awarded April 2003.
- Co-Investigator with Morehead Planetarium and Science Center (MPSC) Outreach Educator, the University of North Carolina at Chapel Hill Department of Physics and Astronomy for teacher workshop instruction of use of remote controlled telescopes in classrooms. Proposal “Observation Based Student Experience in Research Via Exploration (OBSERVE)”, NASA Space Telescope Science Institute IDEAS Program, awarded March 2003.
- Developed two robotic telescope control systems: one for observations of Polaris, a variable stars; and one for real-time web-published imaging of the Sun for public outreach and education.

Awarded grant funding to support PARI programs (2001-2005): \$425,000

AT EAST TENNESSEE STATE UNIVERSITY

Associate Professor in the Physics and Astronomy Department with education, research, and public outreach responsibilities.

Research centered on spectroscopy of long period variable stars. The research included frequent observing trips to Kitt Peak National Observatory, and included undergraduate students who participated in the research experience. Supported with internal grants, and grants from the American Astronomical Society and National Science Foundation Career Award for young faculty. Other research included

- Observations of the July 1994 Comet Shoemaker-Levy/9 collision with Jupiter

- Hubble Space Telescope study of stars in the Orion Nebula
- NASA International Ultraviolet Explorer observations of regions of star formation (1992-1993)
- The design, construction, and implementation of a photoelectric photometer (NSF grant) used on the Southeastern Association for Research in Astronomy 0.9-m telescope at Kitt Peak, Arizona (1991-1994)
- NASA Jet Propulsion Laboratory grant to study terrestrial atmospheric seeing conditions for the astrometry of interplanetary spacecraft (1991-1992)

Courses taught include Applied Physics, Physical Science & Society, Introduction to Astronomy Lab, Electricity and Magnetism I, Electromagnetic Theory, Atomic and Nuclear Physics, Astronomy I and Astronomy II. Awarded East Tennessee State University College of Arts and Sciences Teacher of the Year 1996-97.

Related education initiatives include the visualization of science projects

- Telescope camera and large screen plasmavision television for the new ETSU astronomical observatory; visitors could control the telescope as though they were on the space shuttle. Awarded May 1998.
- The development of a virtual reality lab in physics and astronomy. Awarded March 1998. Students would use 3D eyeglasses to immerse themselves in the night sky. Used for instruction of coordinate systems.

Advisor to Independent Study Students, Advisor to the local chapter of the Society of Physics Students.

Awarded grant funding to support ETSU research and education programs: \$182,000

AT ALLEGHENY OBSERVATORY OF THE UNIVERSITY OF PITTSBURGH

Research Scientist conducting the following studies:

- Study of newly discovered type of stars ("socket stars"). 1990-1994.
- JPL Navigation Systems Division grant for asteroid tracking program, contracted 1989-1991.
- Part of development team to design and study operation characteristics of the proposed space-based Astrometric Imaging Telescope 1986-1991.
- Automated the AO 0.75-m Thaw refractor: hardware interfacing and software (C and Assembler) on IBM/AT compatible, 1988-1991.
- Research at Kitt Peak National Observatory using the 0.9-m telescope.
- Established visible photometry program to study the characteristics of reference stars used in the AO astrometric program, included using the national astronomical facilities at the Kitt Peak National Observatory. 1987-1990.
- Developed the Multichannel Astrometric Photometer FORTRAN, C, Assembler, BASIC, programming on VAX, PDP 11/73, and IBM/ATs and hardware upgrades. 1986-1990.

Awarded grant funding to support JPL and photometry programs: \$63,000

AT NASA AMES RESEARCH CENTER

A National Academy of Science/National Research Council Research fellowship grant to Study of infrared reflection nebulae (1984-1988) where projects included

- Development of IR electro-optical polarimeter for use at the NASA Infrared Telescope facility, 1984-1986
- Study of visible reflection nebulae using the Infrared Astronomical Satellite database. 1984-1986.

Awarded 2 years of salary and travel support funding from the National Academy of Sciences

AT THE WYOMING INFRARED OBSERVATORY, UNIVERSITY OF WYOMING

Doctoral Graduate Student, Physics

- PhD Thesis. 1984.
- Development of Wyoming IR polarimeter, and FORTH and FORTRAN software development. 1982-1984.
- Observed at the NASA IRTF, Cerro Tololo Inter-American Observatory (1.5-m and 4-m), Wyoming Infrared Observatory 2.3-m. 1979-1984.
- University of Wyoming, 1979 - 1984, Instructor in first year FORTRAN programming, Teaching Assistant in Modern Physics, Introductory Astronomy.

AT CENTRAL MICHIGAN UNIVERSITY

Masters Degree Student, Physics

- M.S. Thesis. 1979.
- Photometry of eclipsing binary stars which includes observations at Yerkes Observatory, and writing data reduction code for analysis. 1978.
- Central Michigan University. 1977 - 1979. Teaching assistant in Introductory Physics and Astronomy labs.

AT UNIVERSITY OF WISCONSIN-STEVENS POINT

Undergraduate Student, Physics Major

- UW-Stevens Point. 1974 - 1977. Planetarium Operator.
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Refereed Publications
Michael W. Castelaz

Castelaz, M. W., Cline, J. D., Osborne, C. 2003, Small Radio Telescopes, in *The Future of Small Telescopes In The New Millennium. Volume I - Perceptions, Productivities, and Policies*. Edited by Terry D. Oswalt. *Astrophysics and Space Science Library, Volume 287*, Kluwer Academic Publishers, Dordrecht, 2003. p.271

Smith, B., Leisawitz, J., Castelaz, M. W. & Luttermoser, D. G. 2002, *COBE DIRBE Light Curves of Mira Variables*. *Astronomical Journal*, 123, 948..

Castelaz, M. W., Luttermoser, D., Caton, D. & Piontek, R. 2000, Low Resolution Spectroscopy of Mira Variable Stars: 6200A To 8800A, *Astronomical Journal*, 120, 2627.

Castelaz, M. W., Luttermoser, D. G., & Piontek, R. A. 2000, Vanadium Oxide in the Spectra of Mira Variables, *Astrophysical Journal*, 538, 341

Messer, E. L. & Castelaz, M. W. 1998, Spectroscopy of Mira Variables, *International Amateur Professional Photoelectric Photometry Communications*.

Castelaz, M. W. & Luttermoser, D. G. 1997, Phase Dependent Spectroscopy of Mira Variables, in the 10th Cambridge Workshop, *Cool Stars, Stellar Systems, and the Sun*, ed. R. A. Donahue & J. A. Bookbinder. p. 53.

Lingerfelt, E., Clark, C. J., & Castelaz, M. W. 1997, Spectroscopy and Photometry of the Mira Variables U CVn, V CVn, and R Leo, *International Amateur Professional Photoelectric Photometry Communications*, Issue 71.

Castelaz, M. W. & Luttermoser, D. G. 1997, Phase Dependent Spectroscopy of Mira Variable Stars., *Astronomical Journal*, 114, 1584.

Crowe, K., Heaton, B., Castelaz, M. W. 1996. Spectra of Mira Stars, in *International Amateur Professional Photoelectric Photometry Communications*.

Grady, C. A., Pérez, M. R., Talavera, A., Bjorkman, K. S., de Winter, D., Thé, P.-S., Molster, f., van den Ancker, M., Sitko, M. L., Calvet, N., Morrison, N. D., McCollum, B., Castelaz, M W. 1996, The Beta Pictoris Phenomenon Among Herbig Ae/Be Stars. UV and Optical High Dispersion Spectra, *Astronomy & Astrophysics Supplement Series*, 120, 157.

McCollum, B. & Castelaz, M. W. 1996, Infrared Polarimetry and Imaging of Ultracompact Partially Ionized Optical Sources In The Orion Nebula, *Astrophysics and Space Science*, 224, 509.

Castelaz, M. W. & McCollum, 1995 A Search for Companion Stars to the Mira Variables S Leonis and U Cancri, *Astronomical Journal*, 109. 341.

Szkody, P., Garnavich, P., and Castelaz, M.W. 1994, Ginga and Rosat Observations of The Cataclysmic Variable S193, Publications of the Astronomical Society of the Pacific, 106, 616.

Castelaz, M. W., Powell, H. D., Henson, G., and Williams, J., 1994, Computer Control Of An Optec Photometer Viewer Mirror And Scale, International Amateur Professional Photoelectric Photometry Communications, No. 57.

McCullum, B. & Castelaz, M.W. 1993, IUE Observations of the Socket Star Mt Ori and Its Circumstellar Environment, in *frontiers of Space and Ground-Based Astronomy: Proceedings of the XXVII ESLAB Symposium*, eds. W. Wamsteker, M.S. Longair, and Y. Kondo, Kluwer Academic Publishers.

Gatewood, G, Castelaz, M. W., De Jonge, J. K., Persinger, T., Stein, J., & Stephenson, B. 1992, Map-Based Trigonometric Parallaxes of Open Clusters. II. The Hyades: 51 Tauri, *Astrophysical Journal*, 392, 710.

Castelaz, M.W., Persinger, T., Stein, J., and Powell, H. 1991, Spectral Types and Luminosity Classifications of Reference Stars in Map Regions, *Astronomical Journal*, 102, 2103.

Oswalt, T.D., Rafert, J.B., Wood, M.A., Castelaz, M.W., Henson, G.D., Powell, H.D., Caillault, J.P., Shaw, J.S., Leake, M.A., Marks, D.W., Rumstay, K.S. 1991, The SARA Kitt Peak 0.9-M Telescope Project: Collaborative Research In Astronomy, *Proceedings of the Joint Commission 9 & 25 Meeting on Automated Telescopes for Photometry & Imaging, IAU General Assembly XXI, Buenos Aires, Argentina, 23 July- 1 August 1991.*

Persinger, T., & Castelaz, M. W. 1990, UBVRI, DDO, ubvy, and H-Beta Photometry of Map Region Stars, *Astronomical Journal*, 100, 1621.

Castelaz, M. W., 1990, The Possible Nature of "Socket" Stars in HII Regions, *Astrophysical Journal Letters*, 348, L29.

Castelaz, M. W., and Persinger, T. 1989, Spectral Types and Luminosity Classifications of Map Region Stars Using UBVRI And DDO Photometry, *Astronomical Journal*, 98, 1768.

Castelaz, M. W., 1989, first Detection of the Astrometric Orbit of the Single-Lined Spectroscopic Binary Epsilon Librae, *Astronomical Journal*, 97, 1184.

Gatewood, G., Kiewet de Jonge, J., Castelaz, M. W., Han, I., Persinger, T., Prosser, J., Reilend, T., Stein, J. 1988, A Study of Upgren 1, *Astrophysical Journal*, 332, 917.

Castelaz, M. W. and Grasdalen, G. L., 1988, The Source of flux To Red Nebulosity In NGC 2264, *Astrophysical Journal*, 335, 150.

Castelaz, M. W., and Hackwell, J. A., 1987, The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5, *Astrophysical Journal*, 314, 317.

Castelaz, M. W., Sellgren, K., and Werner, M. W., 1987, IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades, *Astrophysical Journal*, 313, 853.

Castelaz, M. W., Hackwell, J. A., Grasdalen, G. L., and Gehrz, R. D., 1986, An Infrared Reflection Nebula Surrounding SGS1 in the NGC 1333 Dark Cloud *Astrophysical Journal*, 300, 406.

Castelaz, M. W., Gehrz, R. D., Grasdalen, G. L., and Hackwell, J. A., 1985, Spatially Extended 10 Micron Emission from The Infrared Reflection Nebula GSS30 *Publications of the Astronomical Society of the Pacific*, 97, 924.

Castelaz, M. W., Grasdalen, G. L., Hackwell, J. A., Capps, R., and Thompson, D., 1985, GL 961-W: A Pre-Main Sequence Object, *Astronomical Journal*, 90, 1113.

Smith, J., Bentley, A., Castelaz, M. W., Gehrz, R. D., Grasdalen, G. L., and Hackwell, J. A., 1985, Infrared Sources and Excitation of the W40 Complex *Astrophysical Journal* 291, 571.

Castelaz, M. W., Hackwell, J. A., Grasdalen, G. L., Gehrz, R. D., and Gullixson, C., 1985, GSS30: An Infrared Reflection Nebula in the Ophiuchus Dark Cloud, *Astrophysical Journal*, 290, 261.

Grasdalen, G. L., Strom, S. E., Strom, K. M., Capps, R., Thompson, D., and Castelaz, M. W., 1984, High Spatial Resolution IR Observations of Young Stellar Objects: A Possible Disk Surrounding HL Tau, *Astrophysical Journal Letters*, 283, L57.

The Nature And Geometry Of Infrared Reflection Nebulae, Castelaz, M. W., 1984, Ph.D. Thesis, University of Wyoming.