

GILDA E. BALLESTER

Research Professor

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Research Interests:

Characterization of exoplanets with transit spectroscopic observations at UV, optical and IR wavelengths with the Hubble Space Telescope (HST) and through collaborative ground-based observations. Proposals for other instruments. The research spans the properties of the lower, middle, and upper atmospheres, as well as of the extended planet-star interaction regions (magnetospheric interactions). With our current HST Panchromatic Comparative Exoplanet Treasury program (PanCET) we are characterizing ultra-hot and hot Jupiters, as well as warm exoplanets from Jupiter to super-Earth masses. Early research on Io's atmosphere and plasma torus, and on the upper atmospheres, auroras and magnetospheric interactions of Jupiter, Saturn (ongoing) and Uranus with both imaging and spectroscopy. Current collaborations with researchers at: IAP (France), Johns Hopkins U., T.U. of Berlin (D.E.), U. Reims (France), CSIC-INTA (Spain), Tennessee State U., U. of Arizona Steward, STScI, JPL, Harvard-Smithsonian Inst., other USA institutions.

Education:

- Ph. D. (Physics, with minor in Astronomy) 1989 Johns Hopkins University, Baltimore, MD
- M. S. (Physics) 1984, Johns Hopkins University, Baltimore, MD
- B. S. (Physics) 1980, Magna Cum Laude, Universidad de Puerto Rico, Río Piedras, PR

Professional Experience:

- 2020- Research Professor, Univ. of Arizona, Dept. of Planetary Sciences (PtyS), Lunar & Planetary Laboratory (LPL), Tucson, AZ.
- 2014-2020 Senior Research Scientist, *Faculty*, PtyS/LPL
- 2000-2014 Associate Staff Scientist, LPL
- 1997-2000 Associate Research Scientist, Univ. of Michigan, Dept. of Atmos., Oc. & Space Sciences (AOSS), Space Physics Research Lab. (SPRL), Ann Arbor, MI.
- 1993-1997 Assistant Research Scientist Univ. of Michigan, AOSS/SPRL
- 1992 Associate Research Scientist, Dept. of Physics & Astronomy, Center for Astrophysical Sciences, Johns Hopkins Univ.
- 1991-1992 Postdoctoral Fellow, Dept. Earth Sciences, Univ. of Oxford, U.K.
- 1989-1990 Postdoctoral Fellow, Dept. Atmos., Oc. & Planetary Physics, Univ. of Oxford, U.K.
- 1989 Postdoctoral Fellow, Dept. Physics & Astronomy, Johns Hopkins University
- 1983-1989 Research Assistant, Dept. Physics & Astronomy, Johns Hopkins University
- 1981-1983 Teaching Assistant, Gen. Physics, Johns Hopkins Univ.
- 1980-1981 Teaching Assistant, Gen. Physics, Univ. Puerto Rico, Río Piedras Campus, PR
- 1979 Teaching Assistant, Gen. Physics: Univ. Sagrado Corazón, PR

Awards/Honors:

- 1981 NSF Fellowship, Univ. of Puerto Rico
- 1989 Member of Phi Beta Kappa Honorary Society
- 1989 NSF-NATO Postdoctoral Fellowship
- 1994 NASA Group Achievement Awards, HST WFPC2 Camera Science & Calibration Teams
- 1995 Paper of the Year Award, Space Physics Research Laboratory, Univ. of Michigan
- 1998 Latin Woman of the Year Award, Science and Technology, GEMS Cable TV Station
- 2000 Hispanic Engineering Magazine Article
- 2004 Face of "Arizona Alumnus" Vol 81/3, p31

Professional Activities:

- Guest Observing: IUE, IRTF, FUSE, HST
- Instrument Definition/Science Team Member: HST WFPC2 Camera
- Proposal Review Panels: EUVE, NASA, HST
- Proposal Reviewing: NASA, NSF, other
- Refereeing: *Science*, *Nature*, *Icarus*, *Geophys. Res. Letters*, *J. Geophys. Res.*, *Astrophys. J.*
- Scientific Organizing Committees: Io During the Galileo Era, Flagstaff, AZ
- Executive Committees: Univ. of Michigan SPRL Lab. (1993-1997) and AOSS Dept. (1997-1999), Univ. of Arizona (2014-present)

Publications:

1. Skinner, T.E., H.W. Moos and G.E. Ballester, "The spatial dependence of the Jovian auroral emissions", in *Future of Ultraviolet Astronomy Based on Six Years of IUE Research*, NASA CP 2349, 1984.
2. Ballester, G.E., H.W. Moos, P.D. Feldman, D.F. Strobel, M.E. Summers, J.-L. Bertaux, T.E. Skinner, M.C. Festou and J.L. Lieske, "Detection of neutral oxygen and sulfur emissions near Io using IUE", *Astrophys. J.*, 219, L33, 1987.
3. Skinner, T.E., M.T. DeLand, G.E. Ballester, K.A. Coplin, P.D. Feldman and H.W. Moos, "Temporal variation of the Jovian H I Lyman alpha emission (1979-1986)", *J. Geophys. Res.*, 93, 29, 1988.
4. Ballester, G.E., H.W. Moos, P.D. Feldman, D.F. Strobel, T.E. Skinner, J.-L. Bertaux and M.C. Festou, "Io: IUE observations of its atmosphere and the plasma torus", in *a Decade of UV Astronomy with the IUE Satellite*, ESA SP-281, 79, 1988.
5. Livengood, T., H.W. Moos and G.E. Ballester, "Phenomenological analysis of Jovian north auroral H₂ Lyman band emissions", in *a Decade of UV Astronomy with the IUE Satellite*, ESA SP-281, 97, 1988.
6. McGrath, M.A., H.W. Moos, K.A. Coplin and G.E. Ballester, "Jovian Equatorial H₂ emissions from 1979-1987", in *a Decade of UV Astronomy with the IUE Satellite*, ESA SP-281, 89, 1988.
7. Livengood, T.A., H.W. Moos and G.E. Ballester, "Phenomenological analysis of Jovian north auroral H₂ Lyman band emissions", in *a Decade of UV Astronomy with the IUE Satellite*, ESA SP-281, 97, 1988.
8. McGrath, M.A., P.D. Feldman, G.E. Ballester and H.W. Moos, "IUE observations of the Jovian dayglow emission", *Geophys. Res. Lett.*, 16, 583, 1989.
9. McGrath, M.A., G.E. Ballester and H.W. Moos, "The Jovian H₂ dayglow emission (1978-1989)", *J. Geophys. Res.*, 95, 10365, 1990.
10. Ballester, G.E., D.F. Strobel, H.W. Moos and P.D. Feldman, "The atmospheric abundance of SO₂ on Io", *Icarus*, 88, 1, 1990.
11. Baron, R., R.D. Joseph, T. Owen, J. Tennyson, S. Miller and G.E. Ballester, "Imaging Jupiter's aurorae in the 3 to 4 micron band of H₃⁺", *Nature*, 353, 539, 1991.
12. Livengood, T.A., H.W. Moos, G.E. Ballester and R.M. Prangé, "Jovian auroral activity", *Icarus*, 97, 26, 1992.

13. Trafton, L.M., T.R. Geballe, S. Miller, J. Tennyson and G.E. Ballester, "Detection of H_3^+ from Uranus", *Astrophys. J.*, *405*, 761, 1993.
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15. Prangé, R., P. Zarka, G.E. Ballester, T.A. Livengood, L. Denis, T. Carr, F. Reyes, S.J. Bame and H.W. Moos, "Observations of a correlated event between UV and radio emissions from the Jovian aurora", *J. Geophys. Res., Planets*, *98*, 18779, 1993.
16. Ballester, G.E., S. Miller, J. Tennyson, L.M. Trafton and T.R. Geballe, "Latitudinal temperature variations of Jovian H_3^+ ", *Icarus*, *107*, 189, 1994.
17. Ballester, G.E., M.A. McGrath, D.F. Strobel, X. Zhu, P.D. Feldman and H.W. Moos, "Detection of the SO_2 atmosphere on Io with the Hubble Space Telescope", *Icarus*, *111*, 2, 1994.
18. Trauger, J.T., G.E. Ballester, C.J. Burrows, S. Casertano, J.T. Clarke, D. Crisp, R.W. Evans, J.S. Gallagher III, R.E. Griffiths, J.J. Hester, J.G. Hoessel, J.A. Holtzman, J.E. Krist, J.R. Mould, P.A. Scowen, K.R. Stapelfeldt, A.M. Watson and J.A. Westphal, "The on-orbit performance of WFPC2", *Astrophys. J.*, *435*, L3, 1994.
19. Prangé, R., C. Emerich, A. Talavera, D. Rego, W. Harris, J. Clarke, G. Ballester, T. Livengood and M. McGrath, "Far UV spectra and images of cometary impacts on Jupiter observed with IUE and HST", in *Proceedings, European SL9/Jupiter Workshop, ESOC*, *52*, 191, 1995.
20. Achilleos, N., S. Miller, B.M. Dineli, H.A. Lam, J. Tennyson, M.-F. Jagod, T.R. Geballe, L.M. Trafton, R.D. Joseph and G.E. Ballester, "Post-SL9 impact brightness imbalance in the Jovian aurorae", in *Proceedings, European SL9/Jupiter Workshop, ESOC*, *52*, 375, 1995.
21. Clarke, J.T., R. Prangé, G.E. Ballester, J. Trauger, D. Rego, R. Evans, K. Stapelfeldt, W. Ip, F. Paresce, J.-C. Gérard, H. Hammel, M. Ballav, L. Ben Jaffel, J.-L. Bertaux, D. Crisp, C. Emerich, W. Harris, M. Horanyi, S. Miller, A. Storrs and H. Weaver, "Hubble Space Telescope far-ultraviolet imaging of Jupiter during the impacts of Comet Shoemaker-Levy 9", *Highlights of Astronomy*, *10*, 626, 1995.
22. Harris, W.M., G.E. Ballester, J. Barker, J.T. Clarke, M. Combi, M. Vincent, R. Gladstone, J. Kozyra, R. Prangé, L. Ben Jaffel, J.-P. Bibring, C. Emerich, W. Ip, S. Miller, D. Rego, D. Southwood, M. Dougherty, T.A. Livengood, S.A. Budzien, F. Espenak, G.F. Fireman, T. Kostjuk, M.A. McGrath, P.D. Feldman, D.T. Hall, D.F. Strobel, H.W. Moos and L.M. Woodney, *Highlights of Astronomy*, *10*, 636, 1995.
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24. Clarke, J.T., R. Prangé, G.E. Ballester, J. Trauger, R. Evans, D. Rego, K. Stapelfeldt, W. Ip, J.-C. Gérard, H. Hammel, M. Ballav, L. Ben Jaffel, J.-L. Bertaux, D. Crisp, C. Emerich, W. Harris, M. Horanyi, S. Miller, A. Storrs and H. Weaver, "HST far-ultraviolet imaging of Jupiter during the impacts of Comet Shoemaker-Levy 9", *Science*, *267*, 1302, 1995.

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101. Vidal-Madjar, A., J.-M. Désert, A. Lecavelier des Etangs, G. Hébrard, G.E. Ballester, D. Ehrenreich, R. Ferlet, J.C. McConnell, M. Mayor and C.D. Parkinson, "Exoplanet HD 209458b (Osiris): Evaporation strengthened", *Astrophys. J.*, 676, L57, 2008.
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