

# Curriculum Vitae

Name: Paolo Severo Coppi  
Born: December 2, 1964  
Birthplace: La Jolla, California USA  
Citizenship: United States, Italy

## Education

Entered the California Institute of Technology, September 1985. Thesis accepted for Ph.D. in Physics on October 23, 1990. Thesis title: *Radiative Processes in Active Galactic Nuclei*. Thesis advisor: Roger Blandford. Degree awarded June 14, 1991.

Attended Harvard University, September 1982 - June 1985. Received B.A. in Physics (Magna Cum Laude with Highest Honors in Physics).

Attended public school system in Winchester, Massachusetts. Graduated (valedictorian) from Winchester High School in June 1982.

## Employment/Research Experience

Professor, Departments of Astronomy and Physics, Yale University, 2003-.

Associate Professor, Departments of Astronomy and Physics, Yale University, 2001-3.

Assistant Professor, Departments of Astronomy and Physics, Yale University, 1994-2001.

CGRO (Compton Gamma-Ray Observatory) Postdoctoral Fellow at the Enrico Fermi Institute, University of Chicago, 1992-94. Promoted to Research Scientist, September 1993.

Postdoctoral Research Fellow with Profs. A. Königl and D.Q. Lamb at the University of Chicago, Department of Astronomy and Astrophysics, 1990-92.

Graduate Research Assistantship with Prof. R.D. Blandford at the California Institute of Technology during summers of 1987, 1988, 1989, and 1989-1990 academic year.

Graduate Teaching Assistantship in Physics at the California Institute of Technology, 1986-89. Taught computational physics to freshmen.

Attended the 1985 Summer Student Program at CERN (Geneva, Switzerland). Worked in group of Prof. G. Charpak (Nobel prize winner) helping to develop an imaging MWPC (multi-wire proportional counter) particle detector. Invited to join group as graduate student, but decided to study astrophysics.

Worked summer of 1984 with Prof. J. Belcher of MIT. Looked at data obtained by the Plasma Science experiment on Voyager 2 during the crossing of the Jovian magnetosphere.

Worked spring of 1984 with Prof. J. Grindlay of the Harvard-Smithsonian Center for Astrophysics. Looked for optical pulsations from the gamma-ray source Geminga.

Worked summers of 1982, 1983 at Intermetrics, Inc. (Cambridge, MA) on Ada programming language compiler and verification suite for the Air Force. Job obtained through AFCEA fellowship.

## Honors

Yale University Senior Faculty Fellowship, 2004-2005

JILA (Joint Institute for Laboratory Astrophysics) Visiting Fellow, 2003-2004

Compton Gamma-Ray Observatory Postdoctoral Fellowship, 1992-94

Robert A. Millikan Graduate Fellowship in Physics, 1985-86

CERN Summer Student (only  $\sim 1/200$  applicants chosen), 1985

John Harvard Scholar Award for 1983-85

AFCEA (Armed Forces Communications and Electronics Association) Fellowship, 1982

Former student Volker Bromm awarded 2002 Astronomical Society of the Pacific's Trumpler prize for outstanding Ph.D. work.

## Membership in Professional Societies

American Astronomical Society

American Physical Society

## Languages

English, Italian, French, some German

## Journals Have Refereed For

Astronomical Journal, Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, Astronomy and Astrophysics, Nature, Physical Review Letters

## Teaching Experience

Physical Processes in Astronomy: course for Astronomy/Physics juniors designed to introduce them to basic physical processes they are likely to encounter in a career in astronomy. Also stresses how to apply physics in an astronomical setting (e.g., estimate orders of magnitude) and solve equations on a computer.

Mathematical Methods in Physics: standard math methods course for Physics sophomores based on the book by Yale Professor R. Shankar.

Introduction to Radiative Processes: course for first year Astronomy graduate students covering most of Rybicki & Lightman and focusing on a few current applications (e.g., radiative transfer in stellar atmospheres, the Sunyaev-Zeldovich Effect).

Introduction to Dynamics and Classical Mechanics: standard mechanics course for first year physics graduate students at the level of Goldstein.

High Energy Astrophysics: graduate survey course covering current topics in the field.

Computational Methods for Astrophysics: graduate course intended to bring students up to speed on the numerical techniques needed for their theses.

Gave invited lectures for Yale's "Perspectives on Science" course, a special program designed to expose selected, scientifically talented students to current research.

## **Graduate Students**

Chris Sabbey (former postdoc at the Institute of Astronomy, Cambridge; now in equity research.)

Volker Bromm (former postdoc at the Institute of Astronomy, Cambridge and at Center for Astrophysics, Harvard; winner of 2002 Astronomical Society of the Pacific Trumpler Prize for outstanding Ph.D. thesis; offered C3 position at Max-Planck-Institut für Astronomie, Heidelberg; assistant professor at University of Texas, Austin.)

Bruce Roscherr (graduated, but decided to switch to management consulting and now in equity research.)

Thomas Maccarone (former postdoc at ISAS/SISSA, Trieste; now postdoc at University of Amsterdam.)

Andres Escala (postdoc at the University of Chile; first Chilean student to receive astronomy Ph.D. from a Chilean institution.)

Yoav Shaham (fourth year student.)

## **Undegraduate (Senior Thesis) Students**

Mark Hoffman ( won fellowship to Cambridge University and received M.Phil. there; graduate student at University of Chicago; now in management consulting.)

Sarah Gallagher (received PhD. from Penn State University; now research scientist at UCLA after postdoc at MIT.)

Alyssa Reifel (now in medical school.)

Erik Brudvig (working in education.)

Craig Feifarek (working in computer animation.)

## **Postdoctoral Researchers**

Henric Krawczynski (now assistant professor at the University of Washington, St. Louis; received DOE Outstanding Junior Investigator Award)

Toru Tsuribe (now assistant professor at Osaka University, Japan.)

## **Participation in Review Panels**

NSF Astronomy Proposal Peer Reviewer, February 2003

NSF/DOE VERITAS Cherenkov Telescope Array Proposal Review, December 2002

Chandra AO-4 Proposal Review, June 2002

NASA Astrophysics Theory Program Review, January 2002

RXTE AO-6 Proposal Review, October 2000

NASA Astrophysics Theory Program Review, October 1998

Compton Gamma-Ray Observatory Phase 6 Proposal Review, May 1996

NASA Astrophysics Theory Program Review, July 1994

Compton Gamma-Ray Observatory Phase 3 Proposal Review, May 1993

## Grants Awarded

- SWIFT Guest Investigator Program (Theory), 2004, \$35,000, P.I.
- XMM Guest Observer Program, 2003, \$16,000, co-I.
- Chandra Guest Observer Program, 2002, \$60,500, P.I.
- Chandra Guest Observer Program, 2001, \$40,200, co-I.
- Astrophysics Theory Program, “Globular Cluster Formation,” 2000-2003, \$290,000, co-I.
- NASA ADP Program, “Archival Analysis of Short Timescale X-Ray Variability in Blazars,” 2000-2001, \$43,000, P.I.
- Chandra Guest Observer Program, 2000, \$67,500, P.I.
- Astrophysics Theory Program, “Star Formation in the Early Universe,” 1998-2001, \$280,000, P.I.
- NSF Extragalactic Program, “The QUEST Variability Survey,” 1998-2000, \$88,000, Co-I.
- Astrophysics Theory Program, “Propagation of Very High Energy Particles Through Intergalactic Space: Cascading on Background Radiation,” 1997-1998, \$67,000, P.I.
- RXTE Guest Observer, 1997-1998, \$7,000, P.I.
- GRO Guest Observer, 1997-1998, \$10,000, P.I.
- National Academy of Sciences Interacademy Exchange Program Grant (visit to Warsaw, Poland in October 1991), \$1,000, P.I.

## Observing Proposals Accepted (High-Energy Satellites)

- “An INTEGRAL Way To Solve the X-Ray Background Problem,” INTEGRAL AO-3, co-I. (2 Msec deep exposure.)
- Joint Target of Opportunity (TOO) RXTE/INTEGRAL observations of Mrk 501/1ES 1959, RXTE Cycle 10, INTEGRAL AO-3, co-I.
- “Multiwavelength Observations of New TeV Blazars,” RXTE Cycle 10, TOO, co-I.
- “Active Galactic Nuclei in Progenitors of Massive Early-Type Galaxies at  $z \approx 2$ ,” Chandra AO-5 (archival), co-I.
- “XMM-Newton Observations of Cyg X-1,” XMM AO-2, co-I.
- “Jet-Intracluster Medium Interactions of the Head Tail Radio Galaxy 3C 129,” XMM AO-2, co-I.
- “X-Ray and GeV-TeV Gamma-Ray Observations of the Four Strongest TeV Blazars,” RXTE AO-7, co-I. (my postdoc P.I., received 750 ksec of TOO time, most of which triggered).
- “INTEGRAL Observations of the Type I Seyfert Galaxies NGC 5548 and MCG-6-30-15,” Integral AO-1, co-I.
- “Probing the X-Ray Emission of High Luminosity Emission Line Galaxies: Quasar 2’s and the Starburst-AGN Connection,” Chandra AO-2, P.I.

“Resolving The High Temperature Region Between The Subclusters of Abell 115 and Intracluster Medium Interactions of 3C 28,” Chandra AO-2, co-I.

Target of Opportunity (TOO) VSOP/VLBA observation of 0836+710 (a coordinated observation with Chandra), co-I.

Simultaneous Optical/X-Ray Monitoring of AQL X-1, TOO, RXTE AO-5, co-I.

“HBLs in X-Ray Outburst,” TOO, RXTE AO-5, co-I.

“Simultaneous AXAF-RXTE Observations of the Blazar 1156+296,” RXTE AO-4, P.I.

“A Study of the Extended Emission Around Bright Blazar AGN’s,” Chandra AO-1, P.I.

“Correlated X-Ray and TeV Monitoring of Mrk 501,” RXTE AO-4, co-I.

“Hard X-Ray Outbursts and Spectral Variations of GX 339-4,” TOO, RXTE AO-4, co-I.

“BL Lacs in X-Ray Outburst,” TOO, RXTE AO-4, co-I.

“The RXTE Study of Spectral X-Ray Variability in BL Lac Object Mkn 421,” RXTE AO-3, Co-I.

Long (300 ksec) ASCA Observation of Mkn 421, ASCA AO-6, co-I.

“A Broad-Band, Simultaneous Observation of Cygnus X-1,” RXTE AO-3, P.I.

“A Broad-Band, Simultaneous Observation of Cygnus X-1,” GRO Cycle 7, P.I.

“OSSE Observations of Galactic Black Hole Candidates and Their Neutron Star Impostors,” GRO Cycle 4, Co-I.

“GRO Observations of Bright Gamma-Ray Transients,” GRO Cycle 4, Co-I.

### **Invited Talks, Seminars, and Colloquia**

Symposium on “The Crossroads of Particle and Astrophysics,” Max-Planck Institut für Kernphysik, Heidelberg, Germany, December 2004. (Forty-five minute invited talk.)

“The Formation and Growth of Supermassive Black Holes,” Heidelberg Joint Astronomy Colloquium, Heidelberg, Germany, October 2004.

“How Do We Know Antimatter is Absent,” lecture at SLAC Summer Institute, SLAC, California, August 2004

“Massive Black Hole Formation and Growth,” colloquium at Rutgers University, New Jersey, March 2004.

Workshop on “Future Directions in X-Ray Polarimetry,” SLAC, California, February 2004. (Thirty minute invited talk.)

Workshop on “Gravitational Wave Analysis: GWDAW-8,” University of Wisconsin, Milwaukee, December 2003. (50 minute invited review.)

Workshop on “Science with 5@5,” Ringberg Castle, Germany, November 2003. (Thirty minute invited talk.)

Symposium on “High Energy Astrophysics,” Max-Planck Institut für Kernphysik, Heidelberg, Germany, October 2003. (Thirty minute invited talk.)

“The Growth and Formation of Massive Black Holes,” colloquium at the University of Colorado, Boulder, August, 2003.

Workshop on “Particle Acceleration in Astrophysical Objects,” Cracow, Poland, June 2003. (Fourty minute invited review.)

Workshop on “The Astrophysical Sources of Gravitational Waves,” College Park, Maryland, April 2003. (Thirty minute invited talk.)

“The Trouble With TeV Blazars,” colloquium at Penn State University, State College, March 2003.

“The Trouble With TeV Blazars,” theoretical astrophysics seminar at Harvard/CFA, Cambridge, February 2003.

Workshop on “Relativistic Winds and Jets from Compact Objects,” Ringberg Castle, Germany, December 2002. (Thirty minute invited talk.)

Participant in NSF Center for Gravitational Wave Physics Focus Session on “Massive Black Hole Coalescence,” November 2002. (Student Escala gave 30 minute presentation.)

Workshop on “The Universe Viewed in Gamma-Rays,” Tokyo, Japan, September 2002. (Thirty minute invited talk; session chair.)

Symposium on “Making Light of Gravity” in honor of Martin Rees’ 60th birthday, Cambridge, England, July 2002. (Invited participant.)

High Energy Astrophysics Division (HEAD) Meeting, Albuquerque, April 2002. (Thirty minute invited talk.)

“TeV Blazars and Beyond: Very High-Energy Gamma-Ray Astronomy Over the Next Five Years,” seminar at University of Wisconsin, Madison, February 2002.

“Towards Population III: The Physics of Primordial Gas Fragmentation,” seminar at ISAS/SISSA, Trieste, Italy, December 2001.

Workshop on “Laboratory Astrophysics Using High Intensity Particle and Photon Beams,” SLAC, October 2001. (Thirty minute invited talk; session chair.)

“The Diffuse Gamma-Ray Background,” particle-astronomy series colloquium at SLAC, October 2001.

Workshop on “Future Directions for Ground-Based Gamma-Ray Astronomy,” Snowmass, July 2001. (One thirty minute invited talk; one fifteen minute invited talk.)

“High-Energy Emission from Bright Black Holes: Models and Implications,” colloquium at University of California, Los Angeles, May 2001.

“From Dead Stars to the First Stars,” colloquium at University of Texas, Austin, March 2001.

“Probing Extreme Physics and Cosmology with the Next Generation of Gamma-Ray Telescopes,” colloquium at University of California, Santa Cruz, March 2001.

One hour invited lecture on “Very High Energy Cosmic Rays and Gamma-Rays” at the 14th Nishinomiya Yukawa Memorial Symposium, Osaka, Japan, November 2000. (The other foreign lecturers were Blandford, Kulkarni, Meszaros, and Ellison.)

COSPAR workshop on “X-Ray and Gamma-Ray Signatures of Black Holes and Weakly Magnetized Neutron Stars,” Warsaw, Poland, July 2000. (Thirty minute invited talk.)

Workshop on the “Physics of Galaxy Formation,” Tsukuba, Japan, July 2000. (Forty-five minute invited talk; my graduate student Volker Bromm gave a similar invited talk at “The First Generation of Cosmic Structures,” May 2000 at Harvard University.)

Gamma-2000: Symposium on High Energy Gamma-Ray Astronomy, Heidelberg, June 2000. (Thirty minute invited talk.)

Workshop on “Science with H.E.S.S.” [a TeV Cherenkov Telescope Array], Ringberg, Germany, December 1999. (Thirty minute invited talk.)

“Fun with TeV Blazars: Constraints on the Diffuse Infrared Background?” colloquium at Columbia University, December 1999.

“High Redshift Star Formation,” colloquium at University of Michigan, Ann Arbor, November 1999.

“The Physics of Primordial Star Formation,” colloquium at CIDA/University of the Andes, Merida, Venezuela, November 1999.

“Black Holes,” bi-annual dinner speaker for Connecticut Association of Physics Teachers, October 1999.

ITP program on “Black Hole Astrophysics,” Institute for Theoretical Astrophysics, Santa Barbara, May-June 1999. Gave seminar on “Starbursts and AGN.”

Jan Oort Symposium in honor of Martin Rees, Leiden, Holland, May 1999. (Thirty minute invited talk.)

“Black Holes: Large and Small,” lead-off lecture for Frontiers on Science and Engineering (Yale lecture series for college-bound high school students), February 1999.

Workshop on “High Energy Processes in Accreting Black Holes,” Graftevall, Sweden, July 1998. (Forty-five minute invited review.)

Aspen summer workshop on the links between galaxy and star formation; gave session overview talk on primordial (zero metal) star formation, June 1998.

“The First Stars in the Universe,” colloquium at CIDA, Merida, Venezuela, June 1998.

“Blazar AGN,” seminar at Stockholm University, Stockholm, Sweden, July 1997.

Workshop on “Relativistic Jets in AGN,” Krakow, Poland, June 1997. (Workshop summary talk.)

Workshop on “Gamma-Ray Emitting AGN,” Heidelberg, Germany, October 1996. (Thirty minute invited talk.)

“Cosmological Propagation of Very High Energy Gamma-Rays,” colloquium at Institute of Advanced Study, Princeton, October 1995.

Workshop on “TeV Gamma-Ray Astrophysics: Theory and Observations,” Heidelberg, Germany, October 1994. (Thirty minute invited talk.)

Workshop on “Future Directions for Ground-Based Gamma-Ray Astronomy,” Snowmass, July 1994. (Forty-five minute invited review; thirty minute invited talk.)

“Anisotropic Induced Compton Scattering: Constraints on Models of Active Galactic Nuclei,” colloquium at Tokyo Metropolitan University, Tokyo, Japan, June 1994.

Workshop on “Towards a Major Atmospheric Cherenkov Detector, III,” Tokyo, Japan, May 1994. (Thirty-five minute invited review.)

“High Energy Gamma-Ray Astrophysics,” colloquium at Yale University, March 1994.

Workshop on “Pairs, Gamma-Rays, and Blackholes,” Koninki, Poland, October 1993. (Forty-five minute invited talk.)

“High Energy Gamma-Rays from Ultrarelativistic Jets,” colloquium at La Scuola Normale Superiore, Pisa, Italy, February 1993.

“High Energy Gamma-Rays from Jets,” seminar at the Max Planck Institut für Astronomie, Heidelberg, Germany, February 1993.

“High Energy Emission from Ultrarelativistic Jets,” colloquium at the University of Tübingen, Tübingen, Germany, February 1993.

“Everything You Never Wanted to Know About Induced Compton Scattering,” colloquium at J.I.L.A., University of Colorado at Boulder, November 1992.

“High Energy Emission from Ultrarelativistic Jets,” seminar at the Max Planck Institut für Kernphysik, Heidelberg, Germany, September 1992.

Workshop on “Energetic Particles in Astrophysics,” Ringberg Castle, Germany, September 1992. (Thirty minute invited talk.)

“Pair Plasmas and AGN,” colloquium at the University of Kentucky, November 1991.

“Anisotropic Induced Compton Scattering,” colloquium at Nicolaus Copernicus Astronomical Center, Warsaw, Poland, October 1991.

“Nonthermal Pair Plasmas in AGN,” colloquium at Northwestern University, October 1991.

“Anisotropic Induced Compton Scattering – Constraints on Models of Active Galactic Nuclei?” seminar at the Max Planck Institut für Astrophysik, Garching, Germany, June 1991.

Workshop on “Relativistic Hadrons in Cosmic Compact Objects,” Suhora, Poland, October 1990. (Thirty minute invited talk.)

“Nonthermal Pair Plasmas in Active Galactic Nuclei,” seminar at the Max Planck Institut für Astrophysik, Garching, Germany, April 1990.

“Nonthermal Pair Plasmas in Active Galactic Nuclei,” seminar at the Service d’Astrophysique, Saclay, France, April 1990.

“Nonthermal Pair Plasmas in Active Galactic Nuclei,” seminar at the École Polytechnique, Palaiseau, France, April 1990.

STScI-GSFC Workshop on “Ultra-Hot Plasmas and Electron-Positron Pairs in Astrophysics,” April 1989, Space Telescope Science Institute. (Forty-five minute invited talk.)

## Refereed Publications

- Escala, A., Larson, R.B., Coppi, P.S., Mardones, D., 2005. “The Role of Gas in the Merging of Massive Black Holes in Galactic Nuclei. II. Black Hole Merging in a Clumpy Disk.” *Mon. Not. R. Astr. Soc.*, in press soon (favorable report received).
- Treister, E., Castander, F., Maccarone, T., Gawiser, E., Coppi, P., Urry, C.M., Maza, J., Herrera, D., Gonzalez, V., Montoya, C., Pineda, P., 2005. “The Calan-Yale Deep Extragalactic Research (CYDER) Survey: Optical Properties and Deep Spectroscopy of Serendipitous X-ray Sources.” *Astrophys. J.*, in press.
- Rengstorf, A.W., and the QUEST collaboration (including Coppi, P.S.), 2004. “QUEST1 Variability Survey. II. Variability Determination Criteria and 200k Light Curve Catalog.” *Astrophys. J.*, **617**, 184.
- Rubin, K.H.R., van Dokkum, P.G., Coppi, P.S., Johnson, O., Förster Schreiber, N.M., Franx, M., van der Werf, P., 2004. “Chandra Constraints on the AGN Fraction and Star Formation Rate of Red  $z > 2$  Galaxies in the FIRES MS 1054-03 Field.” *Astrophys. J. Lett.*, **613**, 5.
- Escala, A., Larson, R.B., Coppi, P.S., Mardones, D., 2004. “The Role of Gas in the Merging of Massive Black Holes in Galactic Nuclei. I. Black Hole Merging in a Spherical Gas Cloud.” *Astrophys. J.*, **607**, 765.
- Rengstorf, A.W., the QUEST collaboration (including Coppi, P.S.), 2004. “New Quasars Detected via Variability in the QUEST1 Survey.” *Astrophys. J.*, **606**, 741.
- Treister, E., Castander, F.J., Maccarone, T.J., Herrera, D., Gawiser, E., Maza, J., Coppi, P.S., 2004. “An X-Ray-selected Active Galactic Nucleus at  $z=4.6$  Discovered by the CYDER Survey.” *Astrophys. J.*, **603**, 36.
- Vivas, A.K., the QUEST collaboration (including Coppi, P.S.), 2004. “The QUEST RR Lyrae Survey. I. The First Catalog.” *Astron. J.*, **127**, 1158.
- Krawczynski, H., et al. (including Coppi P.S.), 2004. ”Multiwavelength Observations of Strong Flares from the TeV Blazar 1ES 1959+650.” *Astrophys. J.*, **601**, 151.
- Maccarone, T.J. & Coppi, P.S., 2003. “Spectral Fits to the 1999 Aql X-1 Outburst Data.” *Astron. & Astrophys.*, **399**, 1151.
- Castander, F.J., Treister, E., Maccarone, T.J., Coppi, P.S., Maza, J., Zepf, S.E., Guzman, R., 2003. “High Redshift Selected Quasars: CXOCY J125304.0-090737 Joins the Club.” *Astron. J.*, **125**, 1689.
- Castander, F.J., Treister, E., Maza, J., Coppi, P., Maccarone, T., Zepf, S., Guzman, R., Ruiz, M.T., 2003. “The CYDER Survey: First Results.” *Astron. Nachrichten*, **324**, 40.
- Maccarone, T.J. & Coppi, P.S. 2003, “Hysteresis in the Light Curves of Soft X-ray Transients.” *Mon. Not. R. Astr. Soc.*, **338**, 189.
- Bromm, V., Coppi, P.S., Larson, R.B., 2002. “The Formation of the First Stars. I. The Primordial Star Forming Cloud.” *Astrophys. J.*, **564**, 23.
- Sharp, R.G., Sabbey, C.N., Vivas, A.K., Oemler, A., McMahon, R.G., Hodgkins, S.T.,

- Coppi, P., 2002. “Reddening-Independent Quasar Selection from a Wide-Field Optical and Near-IR Imaging Survey,” *Mon. Not. R. Astr. Soc.*, **337**, 1153.
- Maccarone, T.J. & Coppi, P.S., 2002. “Higher Order Variability Properties of Accreting Black Holes,” *Mon. Not. R. Astr. Soc.*, **336**, 817.
- Krawczynski, H., Coppi, P.S., Aharonian, F., 2002. “Time Dependent Modeling of the Markarian 501 X-ray and TeV Gamma-Ray Data Taken During March and April, 1997,” *Mon. Not. R. Astr. Soc.*, **336**, 721.
- Maccarone, T.J. & Coppi, P.S., 2002. “Short Timescale Correlations Between Line and Continuum Fluxes in Cygnus X-1,” *Mon. Not. R. Astr. Soc.*, **335**, 465.
- The QUEST collaboration (including P. Coppi), 2002. “A Large Area CCD Camera for the Schmidt Telescope at the Venezuelan National Observatory,” *Pub. Astr. Soc. Pac.*, **114**, 780.
- Bromm, V., Ferrara, A., Coppi, P.S., Larson, R.B., 2001. “The Fragmentation of Pre-Enriched Primordial Objects,” *Mon. Not. R. Astr. Soc.*, **328**, 969.
- Krawczynski, H., Sambruna, R., Kohnle, A., Coppi, P.S., The HEGRA Collaboration, 2001. “Simultaneous X-Ray and TeV Gamma-Ray Observations of the TeV Blazar Markarian 421 during February and May 2000,” *Astrophys. J.*, **559**, 187.
- Coppi, B. & Coppi, P.S., 2001. “Angular Momentum Transport in Thin Accretion Disks and Intermittent Accretion.” *Phys. Rev. Lett.*, **87**, 1101.
- Coppi, B. & Coppi, P.S., 2001. “Importance of Finite Thermal Energy Density and Optimal Field Bending Modes for the Transport of Angular Momentum in Accretion Disks.” *Annals of Phys.*, **291**, 134.
- Vivas, A.K., Zinn, R., Andrews, P., Bailyn, C., Baltay, C., Coppi, P., Ellman, N., Girard, T., Rabinowitz, D., Schaefer, B., Shin, J., Snyder, J., Sofia, S., van Altena, W., Abad, C., Bongiovanni, A., Briceno, C., Bruzual, G., Della Prugna, F., Herrera, D., Magris, G., Mateu, J., Pacheco, R., Sanchez, Ge. Sanchez, Gu., Schenner, H., Stock, J., Vicente, B., Vieira, K., Ferrin, I., Hernandez, J., Gebhard, M., Honeycutt, R., Mufson, S., Musser, J., Rengstorf, A., 2001. “The QUEST RR Lyrae Survey: Confirmation of the Clump at 50 kpc and Other Over-Densities in the Outer Halo.” *Astrophys. J. Lett.*, **554**, 33.
- Ferrin, I., Rabinowitz, D., Schaefer, B., Snyder, J., Ellman, N., Vicente, B., Rengstorf, A., Depoy, D., Salim, S., Andrews, P., Bailyn, C., Baltay, C., Briceno, C., Coppi, P., Deng, M., Emmet, W., Oemler, A., Sabbey, C., Shin, J., Sofia, S., van Altena, W., Vivas, K., Abad, C., Bongiovanni, G., Bruzual, G., Della Prugna, F., Herrera, D., Magris, G., Mateu, J., Pacheco, R., Sanchez, Ge., Sanchez, Gu., Schenner, H., Stock, J., Vieira, K., Fuenmayor, F., Hernandez, J., Naranjo, O., Rosenzweig, P., Secco, C., Spavieri, G., Gebhard, M., Honeycutt, H., Mufson, S., Musser, J., Pravdo, S., Helin, E., Lawrence, K., 2001. “Discovery of the Bright Trans-Neptunian Object 2000 EB173.” *Astrophys. J. Lett.*, **548**, 243.
- Sabbey, C.N., Oemler, A.G., Coppi, P., Baltay, C., Bongiovanni, A., Bruzual, G., Garcia, C.E., Musser, J., Rengstorf, A.W., Snyder, J.A., 2000. “The Low-Redshift Quasar-

- Quasar Correlation Function from an Extragalactic H $\alpha$  Emission-Line Survey to  $z=0.4$ .” *Astrophys. J.*, **548**, 585.
- Takahashi, T., Kataoka, J., Madejski, G., Mattox, J., Urry, C.M., Wagner, S., Aharonian, F., Catanese, M., Chiappetti, L, Coppi, P., Degrange, B., Fossati, G., Kubo, H., Krawczynski, H., Makino, F., Marshall, H., Maraschi, L., Piron, F., Remillard, R., Takahara, F., Tashiro, M., Terasranta, H., Weekes, T., 2000. “Complex Spectral Variability from Intensive Multiwavelength Monitoring of Mkn 421 in 1998.” *Astrophys. J. Lett.*, **542**, 105.
- Sambruna, R.M., The HEGRA Collaboration, Chou, L., Coppi, P.S., Rothschild, R., Urry, C.M., 2000. “Correlated Intense X-ray and TeV Activity of Mrk 501 in 1998 June.” *Astrophys. J.*, **538**, 127.
- Maccarone, T., Coppi, P.S., & Poutanen, J., 2000. “Time Domain Analysis of Variability in Cygnus X-1.” *Astrophys. J. Lett.*, **537**, 107.
- Krawczynski, H., Coppi, P.S., Maccarone, T., & Aharonian, F.A., 2000. “X-Ray/TeV Gamma-Ray Observations of Several Strong Flares of Mkn 501 during 1997 and Implications.” *Astron. & Astrophys.*, **393**, 57.
- Bromm, V., Coppi, P.S., & Larson, R.B., 1999. “Forming the First Stars in the Universe: The Fragmentation of Primordial Gas.” *Astrophys. J. Lett.*, **527**, L5.
- Gierlinski, M., Zdziarski, A.A., Poutanen, J., Coppi, P.S., Ebisawa, K., Johnson, W.N., 1999. “Radiation Mechanisms and Geometry of Cyg X-1 in the Soft State.” *Mon. Not. R. Astr. Soc.*, **309**, 496.
- Schaefer, B.E. et al. (including Coppi, P.S.), 1999. “Discovery of the Optical Transient of GRB 990308.” *Astrophys. J. Lett.*, **524**, 103.
- Coppi, P.S., & Aharonian, F.A., 1999. “Simultaneous X-Ray and Gamma-Ray Observations of TeV Blazars: Testing Synchro-Compton Emission Models and Probing the Infrared Extragalactic Background.” *Astrophys. J. Lett.*, **521**, 33.
- Coppi, P.S. & Aharonian, F.A., 1999. “Understanding the Spectra of TeV Blazars: Implications for the Cosmic Infrared Background.” *Astropart. Phys.*, **11**, 35.
- Maccarone, T.J., & Coppi, P.S., 1999. “Short Timescale Variability in Mkn 501.” *Astropart. Phys.*, **11**, 193.
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