

Universidad Nacional Autónoma de México
Instituto de Astronomía Observatorio Astronómico Nacional
C.P. 04510, México, D.F. México

This report covers a two year period 1 January 1994 - 31 December 1995.

1. INTRODUCTION

The Instituto de Astronomía is responsible for conducting research in Astronomy and Astrophysics at the Universidad Nacional Autónoma de México (UNAM), for operating the Observatorio Astronómico Nacional (OAN), and for the graduate program in Astronomy in collaboration with the Facultad de Ciencias at UNAM. The areas of research covered are divided into Stellar Astronomy, Interstellar Medium, Galactic and Extragalactic Astronomy, Cosmology and General Relativity, and Astronomical Instrumentation.

2. PERSONNEL

Permanent research staff members are: Aguilar, L., Allen, Ch., Alvarez, M., Arellano, A., Arthur, S.J., Bisiacchi, G.F., Bohigas, J., Cantó, J., Carrasco, L., Carrillo, R., Chavarría, C., Colín, P., Colomé, C., Costero, R., Cruz-González, I., Curiel, S., Dultzin-Hacyan, D., Echevarría, J., Escalante, V., Fierro, J., Firmani, C., Franco, J., Galindo, J., García-Barreto, J.A., Gómez, Y., González, J.J., Henney, W., Herrera, M.A., Koenigsberger, G. (Director), Kurtz, S., Lawrence, S., Levine, S., Lizano, S., López, J.A., Martos, M.A., Moreno, E., Moreno, M.A., Page, D., Peimbert, M., Peña, M., Peña, J.H., Peniche, R., Piccinelli, G., Pishmish, P., Poveda, A., Raga, A., Recillas, E., Reyes, M., Rodríguez, L.F., Rosado, M., Ruelas, A., Salas, L., Sarmiento, A., Schuster, W., Serrano, A., Tapia, M., Torres, S., Tovmasian, G., Vázquez, E., Voitsekhovitch, V.

Technical staff members are: Angeles, F., Bernal, A., Chapa, O., Cobos, F., Córdova, A., Espejo, C., Flores, J.D., García, B., García, V., García, J.G., Garfias, F., González, S., González-Bedolla, S., Gutiérrez, L., Guzmán, C., Harris, N.O., Hernández, B., Iriarte, A., Jiménez, M.E., Langarica, R., Lara, E., Lara, G., Lazo, F., López, E., Luna, E., Maciel, A., Martínez, L., Mata, V., Monroy, S., Montalvo, F., Murillo, M., Ochoa, J.L., Orozco, B., Orozco, J.L., Palomares, J., Pani, A., Parrao, L., Quintero, A., Ruiz, E., Sáenz, E., Sánchez, B., Sevilla, M., Sierra, G., Sohn, E., Sotelo, P., Themsel, E., Tinoco, S., Toledo, F., Váldez, J., Velasco, R., Yustis, J.C., Zavala, G., Zazueta, S.

Postdoctoral fellows: Carigi, L., Carpintero, D., De Diego, J.A., Fernández, M., García-Segura, G., Gueorguiev, L., Kingsburgh, R., O'Donnell, J., Orlov, V.

Graduate Students: Ambrocio, P., Arias, L., Arrieta, A., Avila, V., Ayala, S., Ballesteros, J., Benítez, M., Benítez, E., Carrillo, R., Contreras, M.E., Cruz, F., Cuéllar, G., D'Alessio, P., Díaz, R.I., Espresate, J., García, J.L., González, D., Hernández, H.M., Labrandero, M.J., Lebrón, M., Luridiana, V., Medina, S., Muñoz, G., Noriega, J.H., Olguin, L., Orozco, M.J., Osorio, M., Pichardo, B., Rojas, A., Rojo, E., Santillán, A., Segura, A., Valenzuela, O., Vázquez, G.

3. RESEARCH FACILITIES

The Instituto de Astronomía has research facilities in Mexico City; Ensenada, Baja California; and Morelia, Michoacan. It operates observatories in San Pedro Mártir (SPM), Baja California (2.1m, 1.5m, and 0.84m telescopes), and Tonantzintla, Puebla (1.0m telescope). Instrumentation includes: REOSC Echelle and B & Ch spectrographs; IR camera and spectrometer system (CAMILA); Scanning Fabry-Perot interferometer (PUMA); IR (K, L, M), Strömgen (ubvy and H β), and double photometers; and a variety of CCD detectors ranging in size from 512 x 512 to 2024 x 2024 pixels. Computing facilities include UNIX workstations and access to UNAM's CRAY YMP/432 supercomputer. Satellite 64kbps links connect Ensenada and SPM to Mexico City. In support of instrumentation development there are optics, mechanics and electronics laboratories in both Mexico City and Ensenada, and mechanics and electronics shops in SPM.

4. RESEARCH PROGRAMS

Star Formation and Stellar Astronomy, Interstellar Medium, Galactic Astronomy, Extragalactic Astronomy, and Astronomical Instrumentational Development.

5. INSTRUMENTATION AND LARGE TELESCOPE PROJECTS

The construction of a Scanning Fabry-Perot interferometer was successfully completed. The optical design allows a field coverage of 10 arcmin, a spectral coverage from 3500 - 8000 Å with a free spectral range of 19.68 Å, and a resolution of 0.41 Å at H α . The design allows it to be coupled to a photon counting device as well as to a large format CCD. The control system is based on a PC-compatible computer which is responsible for controlling the (Queensgate) etalon and the instrument.

In collaboration with U. Massachusetts at Amherst, the construction of an IR camera/spectrograph (CAMILA) was concluded. It is based on a NICMOS 3 Hg Cd Te detector developed by Rockwell with a spectral range of 1-2.5 μ m. The initial configuration of the system consists of the following components: detector cryostat, detector control electronics, low noise preamplifiers, detector-PC interface, operating system and optics. The complete optical configuration allows the following modes of operation: direct imaging (12 filter positions) and polarimetry, and spectroscopy on three dispersion modes (low, medium and high resolution).

An active support system with 18 actuators for the primary mirror of the 2.1m telescope was designed and installed successfully. This active optics system allows for the correction of low order aberrations identified by several wavefront analysis techniques.

In 1993 the Institute applied for a grant from CONACyT for the construction of a 6.5-meter telescope for the SPM

Observatory: the Telescopio Mexicano Optico-Infrarrojo de Nueva Tecnología (TIM). Originally a copy of the Magellan Project, and based on a monolithic, borosilicate honeycomb primary mirror and a welded-plate structure, the TIM concept was changed in 1995 to a 6.5-meter segmented primary with a tubular structure, thus reducing the overall cost. Though similar to the Keck I and II projects, it will differ in its "total" active control of each segment. The intention is to build the support structure in México and to polish parts of the optical system at the Institute's optical facility.

6. SPM SITE CHARACTERIZATION PROGRAMS

Detailed measurements of the atmospheric turbulence and climatological conditions have been carried out at SPM. The results obtained during a three year period with the Site Testing Telescope (STT) from Steward Observatory yielded a median seeing of 0.61 arcsec (FWHM) and a first quartile of 0.50 arcsec. These were confirmed by independent measurements with the monitor of the Observatories of the Carnegie Institution. Measurements with the Micro-Thermal Array (MTA) show that the seeing decreases by 0.1 arcsec at a height of 15 meters.

PUBLICATIONS

Publications During 1994:

- Afflerbach, A., Churchwell, E., Hofner, P., and Kurtz, S. "A Multi-Line, Multi-Resolution VLA Study of the Ultracompact HII Region G29.9-0.0," *Astrophysical Journal*, V. 437, pp. 697-704, 1994
- Anglada, G., Rodríguez, L.F., Girart, J.M., Estalella, R., and Torrelles, J.M. "A Radio Candidate for the Exciting Source of the L1287 Bipolar Outflow," *Astrophysical Journal Letters*, V. 420, pp. L91-L93, 1994
- Arellano-Ferro, A., Nuñez, N., and Avila, J. "On the Period Variations of the Delta Scuti Star VZ Cancri," *Publications of the Astronomical Society of the Pacific*, V. 106, pp. 696-703, 1994
- Arthur, S.J., Dyson, J.E., and Hartquist, T.W. "Mass-loaded Astronomical Flows - VII. Transonic Flows From the Cores of Planetary Nebulae," *Monthly Notices Royal Astronomical Society*, V. 269, pp. 1117-1122, 1994
- Auer, L.H., and Koenigsberger, G. "Line Profile Variations from Atmospheric Eclipses: Constraints on the Wind Structure in W-R Stars," *Astrophysical Journal*, V. 436, pp. 859-870, 1994
- Belmonte, J.A., Michel, E., Alvarez, M., Jiang Shi, Y., Chevreton, M., Auvergne, M., Liu, Y.Y., Goupil, M.J., Baglin, A. and Roca-Cortés, T. "Time-Resolved Photometry of BN & BU CNC, Two Delta Scuties in the Praesepe Cluster. Fourth Photometry Campaign of the STEPPI Network," *Astronomy and Astrophysics*, V. 283, pp. 121-128, 1994
- Bohigas, J. "Bidimensional Spectral Analysis of NGC6302," *Astronomy and Astrophysics*, V. 288, pp. 617-633, 1994
- Carney, B.W., Latham, D.W., Laird, J.B., and Aguilar, L.A. "A Survey of Proper Motion Stars XII: an Expanded Sample," *Astronomical Journal*, V. 107, pp. 2240, 1994
- Cesaroni, R., Churchwell, E., Hofner, P., Walmsley, C.M., and Kurtz, S. "Hot Ammonia Towards Compact HII Regions," *Astronomy and Astrophysics*, V. 288, pp. 903-920, 1994
- Chavarría-K., C., Moreno-Corral, M.A., Hernández-Toledo, H., Terranegra, L., and de Lara, E. "H-Alpha Interferometric, Optical and Near IR Photometric Studies of Star Forming Regions. II. NGC7380E/Sh2-142/NGC 7380 Complex," *Astronomy and Astrophysics*, V. 283, pp. 963-972, 1994
- Colín, P., Schramm, D.N., and Peimbert, M. "Counts of Galaxies in a Merger Model," *Astrophysical Journal*, V. 426, pp. 459-472, 1994
- Coziol, R., Demers, S., Peña, M., and Barnroud, R. "The Montreal Blue Galaxy Survey II. Second List of UV-Bright Candidates," *Astronomical Journal*, V. 108, pp. 405-416, 1994
- Cruz-González, I., Carrasco, L., Serrano, A., Guichard, J., Dultzin-Hacyan, D., and Bisiacchi, G.F. "Mepsicon Spectrophotometry of Seyfert Galaxies. I. Spectral Atlas," *Astrophysical Journal Supp. Series*, V.7, pp. 47-62, 1994
- Della-Valle, M., Mirabel, I.F., and Rodríguez, L.F. "The Optical and Radio Counterpart of the X-Ray Nova Ophiuchi 1993," *Astronomy and Astrophysics*, V. 290, pp. 803-806, 1994
- Dultzin-Hacyan, D., and Benítez, E. "Near and Far Infrared Emission of Seyfert 2 Galaxies and Various Types of Star-Forming Galaxies," *Astronomy and Astrophysics*, V. 291, pp. 720-724, 1994
- Echevarría, J. "On the Mass-Transfer-Orbital Period Relation in Cataclysmic Variables," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, p. 125, 1994
- Escalante, V., and Víctor, G.A. "Transition Probabilities and Photoionization of Neutral Atomic Oxygen," *Atomic Data and Nuclear Data Tables*, V. 56, pp. 213-229, 1994
- Firmani, C., and Tutukov, A. "Bursting and Stationary Star Formation in Disks and Nuclei of Galaxies," *Astronomy and Astrophysics*, V. 288, pp. 713, 1994
- Franco, J.J., Miller, W.W., Arthur, S.J., Tenorio-Tagle, G., and Terlevich, R. "Thin Shell Formation in Radiative Shocks I: Supernova Remnants in Low-Density Media," *Astrophysical Journal*, V.435, pp. 805-814, 1994
- Franco, J., Shore, N.S., and Tenorio-Tagle, G. "On the Massive Star-Forming Capacity of Molecular Clouds," *Astrophysical Journal*, V. 436, pp. 795-799, 1994
- Garay, G., Lizano, S., and Gómez, Y. "The Velocity Structure of the Cometary HII Regions, G13.87+0.28, G32.80+0.19-B, and G61.48+0.09-B1," *Astrophysical Journal*, V. 429, pp. 268-284, 1994
- García-Barreto, J.A., Downes, D., and Huchtmeier, W.K. "HI Deficiency in the Coma I Cloud of Galaxies," *Astronomy and Astrophysics*, V. 288, pp. 705, 1994
- Gavazzi, G., Garilli, B., Carrasco, L., Boselli, A., and Cruz-González, I. "A CCD Survey of Galaxies. II. Observations with the 2.1m Telescope at San Pedro Mártir," *Astronomy and Astrophysics Supp. Series*, V. 104, pp. 271-314, 1994
- Girart, J.M, Rodríguez, L.F., Anglada, G., Estalella, R., Tor-

- relles, J.M., Martí, J., Peña, M., Ayala, S., Curiel, S., and Noriega-Crespo, A. "Ammonia Downstream from HH 80 North," *Astrophysical Journal Letters*, V. 435, p. L145, 1994
- Gómez, Y., Rodríguez, L.F., Contreras, M.E., and Moran, J.M. "Anomalous Water Masers in OH/IR Stars," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 97-102, 1994
- Gómez, J.F., Curiel, S., Torrelles, J.M., Rodríguez, L.F., Anglada, G., and Girart, J.M. "The Molecular Core and the Powering Source of the Bipolar Molecular Outflow NGC 2264G," *Astrophysical Journal*, V. 436, pp. 749-753, 1994
- Henney, W.J. "Polarization Profiles of Scattered Emission Lines. I. General Formalism for Optically Thin Rayleigh Scattering," *Astrophysical Journal*, V. 427, pp. 288-304, 1994
- Henney, W.J., Raga, A.C., and Axon, D.J. "Polarization Profiles of Scattered Emission Lines. II. Upstream Dust Scattering in the HH 1 Jet," *Astrophysical Journal*, V. 427, pp. 305-314, 1994
- Hobart, M.A., Peña, J.H., Peniche, R., Ríos-Herrera, M., Ríos-Berumen, M., Rodríguez, E., López-Cruz, O., and Garrido, R. "Photometry and Period Behavior of Selected W UMa Type Stars," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 111-123, 1994
- Hollenbach, D., Johnstone, D., Lizano, S., and Shu, F.H. "Photo-evaporation of Disks Around Massive Stars and Application to Ultracompact HII Regions," *Astrophysical Journal*, V. 428, p. 654, 1994
- Kenyon, S.J., Hartmann, L., Hewett, R., Carrasco, L., Cruz-González, I., Recillas, E., Salas, L., Serrano, A., Strom, K.M., Strom, S.E., and Newton, G. "The Hot Spot in DR Tauri," *Astronomical Journal*, V. 107, pp. 2153-2263, 1994
- Kingsburgh, R.L., and Barlow, M.J. "Elemental Abundances for a Sample of Southern Galactic Planetary Nebulae," *Monthly Notices Royal Astronomical Society*, V. 271, p. 257, 1994
- Koenigsberger, G., Moffat, A.F.J., St. Louis, N., Auer, L.H., Dissen, C., and Seggewiss, W. "Remarkable Long-Term Changes in the SMC W-R System HD5980," *Astrophysical Journal*, V. 436, pp. 301-311, 1994
- Kurtz, S., Churchwell, E., and Wood, D.O.S. "Ultracompact HII Regions: New High Resolution Radio Images," *Astrophysical Journal Supp.* V. 91, pp. 659-712, 1994
- Laval, A., Gry, C., Rosado, M., Marcelin, M., and Greve, A. "The Exciting Star of the Small Bubble N120A in the LMC," *Astronomy and Astrophysics*, V. 288, pp. 572-580, 1994
- Le Coarer, E., Rosado, M., Georgelin, Y.P., Viale, A., and Goldes, G. "H-Alpha Survey of the Small Magellanic Cloud," *Astronomy and Astrophysics*, V. 280, pp. 365-372, 1994
- Levine, S., and Sparke, L. "The Stability of Perfect Elliptic Disks: I. The Maximum Streaming Case," *Astrophysical Journal*, V. 428, pp. 493-510, 1994
- Marchenko, S., Moffat, A.F.J., and Koenigsberger, G. "The W-R Binary V444 Cyg Under the Spectroscopic Microscope. Improved Characteristics of the Components and their Interaction Seen in HeI," *Astrophysical Journal*, V. 422, pp. 810-822, 1994
- Márquez, A., and Schuster, W.J. "uvby-beta Photometry of High-Velocity and Metal-Poor Stars. VII. Ages of Halo and Thick-Disk Field Stars," *Astronomy and Astrophysics Suppl. Series*, V. 108-1, pp. 341-358, 1994
- Marziani, J.P., Keel, W., Dultzin-Hacyan, D., and Sulentic, J. "Multiple High Velocity Emission-Line Systems in the E + S Pair," *Astrophysical Journal*, V. 435, pp. 668-678, 1994
- Massi, M., and Lizano, S. "Critical Density for Magnetic Decoupling: Preliminary Observations," *Astronomy and Astrophysics*, V. 287, pp. 581, 1994
- Mirabel, I.F., Duc, P.A., Rodríguez, L.F., Teyssier, R., Paul, J., Claret, A., Auriere, M., Golombek, D., and Martí, J. "The Radio/Infrared Counterpart of the Hard X-Ray Transient in Aquila: A Possible Source of Repeated soft Gamma-Ray Bursts," *Astronomy and Astrophysics*, V. 282, pp. L17-L20, 1994
- Mirabel, I.F. and Rodríguez, L.F. "A Superluminal Source in the Galaxy," *Nature*, V. 371, pp. 46-48, 1994
- Miralles, M.P., Rodríguez, L.F., Tapia, M., Roth, M., Persi, P., Ferrari-Toniolo, M., and Curiel, S. "VLA Observations of Cyg OB2 No. 5: Detection of a Weak Radio Companion and New Observations and Models for the Main Components," *Astronomy and Astrophysics*, V. 282, pp. 547-553, 1994
- Miralles, M.P., Rodríguez, L.F., and Scalise, E. "Radio Continuum, Ammonia, and Water Maser Observations of Bright Unassociated IRAS Point Sources," *Astrophysical Journal (Supp.)*, V. 92, pp. 173-188, 1994
- Page, D. "Geminga: a Cooling Superfluid Neutron Star," *Astrophysical Journal*, V. 428, pp. 250-260, 1994
- Palous, J., Tenorio-Tagle, G., and Franco, J. "Star Formation in Differentially Rotating Galactic Disks: The Physics of Self-Propagation," *Monthly Notices Royal Astronomical Society*, V. 270, p. 75, 1994
- Peimbert, M., Sarmiento, A., and Colín, P. "Chemical Evolution of the Solar Neighborhood: Yields, Black Holes and the Amount of Mass in Substellar Objects," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 181-186, 1994
- Peña, M., Torres-Peimbert, S., Peimbert, M., Ruiz, M.T., and Maza, J. "A Thermal Pulse in Progress in the Nucleus of the LMC Planetary Nebula N66," *Astrophysical Journal*, V. 428, p. L9, 1994
- Peña, M., Olgumn, L., Ruiz, M.T., and Torres-Peimbert, S. "LM1-64: a High Excitation Planetary Nebula with a WR Nucleus in the LMC," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 27-32, 1994
- Peña, J.H., and Peniche, R. "Photometry of Open Clusters IV. NGC 1662, NGC 1444, NGC 2169, and NGC 7209," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 139-152, 1994
- Peña, J.H., Peniche, R., Bravo, H., and Yam, O. "Photometry of Open Clusters II. NGC 1342," *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 7-16, 1994
- Peña, J.H., Peniche, R., and Quintero, A. "On the Nature of

- V915 Sgr and the Nebular object in its Vicinity,” *Revista Mexicana de Astronomía y Astrofísica*, V. 28, pp. 105-109, 1994
- Persi, P., Roth, M., Tapia, M., Ferrari-Toniolo, M., and Marenzi, R. “The Young Stellar Population Associated with the HII region NGC 3576,” *Astronomy and Astrophysics*, V. 282, p. 474, 1994
- Poveda, A., Herrera, M.A., Allen, C., Cordero, G., and Lavalley, C. “Statistical Studies of Visual Double and Multiple Stars. II. A Catalogue of Nearby Wide Binary and Multiple Systems,” *Revista Mexicana de Astronomía y Astrofísica*, V. 28-1, pp 43-89, 1994
- Rodríguez, L.F., Cantó, J., Torrelles, J.M., Gómez, J.F., Anglada, G., and Ho, P.T.P. “Subarcsecond VLA Maps of the Disk and the Jet in HL Tauri,” *Astrophysical Journal Letters*, V. 427-2, pp. L103-L106, 1994.
- Rodríguez, L.F., and Bastian, T.S. “Rotation in the Ionized Envelope of MWC349A,” *Astrophysical Journal*, V. 428, pp. 324-328, 1994
- Rodríguez, L.F., Garay, G., Curiel, S., Ramírez, S., Torrelles, J.M., Gómez, Y., and Velázquez, A. “CEP A HW2: A Powerful Thermal Radio Jet,” *Astrophysical Journal Letters*, V. 430, pp. L65-L68, 1994
- Rodríguez, L.F., and Reipurth, B. “The Exciting Source of the Herbig-Haro 111 Jet Complex: VLA Detection for a One-Sided Radio Jet,” *Astronomy and Astrophysics*, V. 281, pp. 882-888, 1994
- Rosado, M., Le Coarer, E., and Georgely, Y.P. “Kinematics of SNRs in the SMC 1. The SNRs Inside the Nebular Complex N19, the SNR 0046-73.5 and the SNR 0050-72.8,” *Astronomy and Astrophysics*, V. 286, pp. 231-242, 1994
- Sadsaoud, H., Le Contel, J.M., Chapellier, E., Le Contel, D., and González-Bedolla, S. “Photometric and Spectroscopic Observations of the 53 Persei Type Star S Cassiopeiae,” *Astronomy and Astrophysics*, V. 287, pp. 509-516, 1994
- Sareyan, J.P. Chauville, J., Van’t Veer, F., Alvarez, M., González-Bedolla, S., and Valera, F. “Detection of a Photometric Period in the Non-Eclipsing Binary HR8800. Towards a Better Description of the System,” *Astronomy and Astrophysics*, V. 291, pp. 815-819, 1994
- Shu, F.H., Najita, D., Ostriker, E., Wilkin, F., Ruden, S., and Lizano, S. “Magnetocentrally Driven Flows From Young Stars and Disks. I. A Generalized Model,” *Astrophysical Journal*, V. 428, p. 781, 1994
- Shu, F.H., Najita, D., Ruden, S., and Lizano, S. “Magnetocentrally Driven Flows from Young Stars and Disks II. Formulation of the Dynamical Problem,” *Astrophysical Journal*, V. 429, p. 797, 1994
- Terranegra, L., Chavarría-K., C., Díaz, S., and González-Patiño, D. “uvby-beta Photometry of Orion Population Stars in Six Galactic Star Forming Regions,” *Astronomy and Astrophysics Supp.* V. 104, pp. 557-574, 1994.
- Torrelles, J.M., Gómez, J.F., Ho, P.T.P., Rodríguez, L.F., Anglada, G., and Cantó, J. “The Puzzling Distribution of the High-Density Molecular Gas in HH 1-2A Contracting Interstellar Toroid?,” *Astrophysical Journal*, V. 435-1, pp. 290-312, 1994
- Vázquez-Semadeni, E., “Hierarchical Structure in Nearly Pressureless Flows as a Consequence of Self-Similar Statistics,” *Astrophysical Journal*, V. 423, pp. 681, 1994
- Worthey, G., Faber, S.M., González, J.J., and Burstein, D. “Old Stellar Populations. V. Absorption Feature Indices for the Complete Lick/IDS Sample of Stars,” *Astrophysical Journal Supp. Series*, V. 94, pp. 687-722, 1994 **Publications During 1995:**
- Anglada, G., Estalella, R., Mauersberger, R., Torrelles, J.M., Rodríguez, L.F., Cantó, J., Ho, P.T.P., and D’Alessio, P. “The Molecular Environment of the HH34 System,” *Astrophysical Journal*, V. 443, pp. 682-697, 1995
- Biro, S., Raga, A.C., and Cantó, J. “Numerical Simulation of 2D Jets with Time-Dependent Direction of Ejection,” *Monthly Notices Royal Astronomical Society*, V. 275, pp. 557-566, 1995
- Cabrera-Cañón, J., Moreno, E., et. al. “The Location of Stellar Clusters in the Big Dent: an Age Gradient Along the Zeta Axis,” *Astrophysical Journal*, V. 448, pp. 149, 1995
- Canalizo, G., Koenigsberger, G., Peña, D., and Ruiz, E., “Spectral Variations and a Classical Curve-of-Growth Analysis of HDE226B68 (CyG X-1),” *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 63-86, 1995
- Cantó, J., and Raga, A.C., “The Dynamics of a Jet in a Supersonic Side Wind,” *Monthly Notices Royal Astronomical Society*, V. 277, pp. 1120-1124, 1995
- Carigi, L., Colín, P., Peimbert, M., and Sarmiento, A. “Chemical Evolution of Irregular and Blue Compact Galaxies,” *Astrophysical Journal*, V. 445-1, pp. 98-107, 1995
- Carpintero, D.D., and Muzzio, J.C. “Radial Orbit Instability in a Hubble-Expanding Universe,” *Astrophysical Journal*, V. 440, pp. 5-21, 1995
- Carrasco, L., Cruz-González, I., Recillas, E., Salas, L., Serrano, A., Strom, K.M., Strom, S.E., and Newton, G. “The Hot Spot in DR Tauri,” *Astronomical Journal*, V. 107, pp. 2153-2163, 1995
- Chelli, A., Cruz-González, I., and Reipurth, B. “Near Infrared Observations of Southern Multiple Systems,” *Astronomy and Astrophysics Supp. Series*, V. 114, pp. 135-142, 1995
- Cherepashchuk, A.M., Koenigsberger, G., Marchenko, S., and Moffat, A.F.J. “On the Relative Luminosities of the Stars in the Wolf-Rayet Binary Systems V444 Cyg,” *Astronomy and Astrophysics*, V. 293, pp. 142-152, 1995
- Colín, P. “Number and Luminosity Evolution of Interacting Galaxies as a Natural Explanation for the Galaxy Counts,” *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 91-99, 1995
- Curiel, S., Raymond, J.C., Wolfire, M., Hartigan, P., Morse, J., Schwartz, R.D., and Nisenson, P. “Molecular H₂ Emission in HH47A: HST GHRS and FOC Observations,” *Astrophysical Journal*, V. 453, pp. 322-331, 1995
- De Pree, C.G., Rodríguez, L.F., and Goss, W.M. “Ultracompact HII Regions: Are Their Lifetimes Extended by Dense, Warm Environments?,” *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 39-44, 1995
- De Pree, C.G., Rodríguez, L.F., Dickel, H.R. and Goss, W.M. “Rotation and Outflow in Compact HII Regions: VLA Observations of the Molecular and Ionized Gas in

- NGC 6334A and NGC 6334F," *Astrophysical Journal*, V. 447, pp. 220-235, 1995
- Esteban, C., and Peimbert, M. "The Chemical Enrichment by Massive Stars in Wolf-Rayet Galaxies," *Astronomy and Astrophysics*, V. 300, pp. 78, 1995
- Esteban, C., and Rosado, M. "Kinematical Study of Ring Nebulae Around Galactic WR Stars," *Astronomy and Astrophysics*, V. 304, pp. 491-504, 1995
- Falle, S.A.E.G., and Raga, A.C. "The Structure of Knots in Variable Stellar Jets, II. Asymmetric Knots," *Monthly Notices of the Royal Astronomical Society*, V. 272, p. 785, 1995
- Fernández, M., "Photometric Observations of Pre-Main Sequence Objects," *Astronomy and Astrophysics Supp. Series*, V. 113, pp. 473-475, 1995
- Fernández, M. "H Alpha Emission from Pre-Main Sequence Stars," *Astronomy and Astrophysics Supp. Series*, V. 114, pp. 439-464, 1995
- García-Barreto, J.A., Franco, J., Guichard, J., and Carrillo, R. "The Central Regions of the Galaxy NGC4691: A Remarkable Structure with a Fast Outflow Near the Nucleus," *Astrophysical Journal*, V. 451, pp. 156-166, 1995
- Garnett, D.R., Skillman, E.D., Dufour, R.J., Peimbert, M., Torres-Peimbert, S., Terlevich, R. Terlevich, E., and Shields, G.A. "The Evolution of C/O in Dwarf Galaxies," *Astrophysical Journal*, V. 443, pp. 65, 1995
- Garnett, D.F., Dufour, R.J., Peimbert, M., Torres-Peimbert, S., Shields, G.A., Skillman, E.D., Terlevich, R., and Terlevich, R.J. "The Si/O Abundances Ratio in Extragalactic HII Regions from HST UV Spectroscopy," *Astrophysical Journal*, V. 449, pp. L77, 1995
- Gavazzi, G., Boselli, A., and Carrasco, L. "A CCD Survey of Galaxies IV. Observations with the 2.1m Telescope at SPM," *Astronomy and Astrophysics Supp. Series*, V. 112, pp. 257-289, 1995
- Gavazzi, G., Contursi, A., Carrasco, L., et.al. "The Radio and Optical Structure of Three Peculiar Galaxies in A 1367," *Astronomy and Astrophysics*, V. 304, p. 325-340, 1995
- Giridhar, S., and Arellano-Ferro, A. "A Critical Compilation of Oscillator Strengths for FeII Lines," *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 23, 1995
- Gómez, Y., Garay, G., and Lizano, S. "Warm Molecular Gas Associated with Cometary HII Regions," *Astrophysical Journal*, V. 453, pp. 727, 1995
- Gómez, Y., Rodríguez, L.F., and Martí, J. "Thermal Jets and H₂O Masers: The Case of HH 80-81," *Astrophysical Journal*, V. 453, pp. 268-270, 1995
- Henney, W.J., and Axon, D.J. "Polarization Profiles of Scattered Emission Lines. III. The Effects of Multiple Scattering and Non-Rayleigh Phase Functions," *Astrophysical Journal*, V., 454, pp.233-253, 1995
- Koenigsberger, G., Guinan, E., Auer, L.H., and Georgiev, L. "Ultraviolet Observations of the Eruption in the Small Magellanic Cloud W-R System HD5980," *Astrophysical Journal Letters*, V. 452, pp. L107-L110, 1995
- Korista, K.T., Alloin, D., Carrillo, R., and Dultzin-Hacyan, D. "Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Nuclei, VIII. An Intensive HST, IUE, and Ground-Based Study of NGC5548," *Astrophysical Journal Supp. Series*, V. 97, pp. 285-330, 1995
- Lim, A.J., and Raga, A. "A Distribution Function Calculation of the H α Profiles of High-Velocity Shocks," *Monthly Notices of the Royal Astronomical Society*, V. 277, p. 353, 1995
- Lizano, S., and Giovanardi, C. "Thermal Structure of Mixing Layers in Bipolar Outflows," *Astrophysical Journal*, V. 447, pp. 742-751, 1995
- López, J.A., Vázquez, R., and Rodríguez, L.F. "The Discovery of a Bipolar, Rotating, Episodic Jet (BRET) Associated with the Planetary Nebula K_jPn8," *Astrophysical Journal Letter*, V. 455, pp. L63-L66, 1995
- Luna, E., and Cordero, A. "Medición del Radio de Curvatura Paraxial y la Constante de Conicidad de una Superficie Cónica Cóncava," *Revista Mexicana de Física*, V. 41-6, pp. 857-864, 1995
- Martí, J., Rodríguez, L.F., and Reipurth, B. "Large Proper Motions and Ejection of New Condensation in the HH80-81 Thermal Jet," *Astrophysical Journal*, V. 449, pp. 184-187, 1995
- Massa, D., Fullerton, A.W., Nichols, J.S., Owocki, S.P., Prinja, R.K., St. Louis, N., Willis, A.J., Altner, B., Bolton, C.T., Koenigsberger, G., *et al.* "The IUE Mega Campaign: Wind Variability and Rotation in Early Type Stars," *Astrophysical Journal Letters*, V. 452, pp. L53-L55, 1995
- Muslimov, A., and Page, D. "Delayed Switch-on of Pulsars," *Astrophysical Journal Letters*, V. 440, pp. L77-L80, 1995
- Page, D., Shibano, Yu, A., and Zavlin, V.E. "Geminga's soft X-ray Emission and the Structure of its Surface," *Astrophysical Journal Letters*, V. 451, pp. L21-L24, 1995
- Page, D. "Surface Temperature of a Magnetized Neutron Star and Interpretation of the ROSAT Data. I. Dipole Fields," *Astrophysical Journal*, V. 442, pp. 273-285, 1995
- Page, D. "Neutron Stars: Probes for High Density Baryon Pairing," *Revista Mexicana de Física*, V. 41, pp. 178-184, 1995
- Passot, T., Vázquez-Semadeni, E., and Pouquet, A. "A Turbulent Model for the Interstellar Medium. II., Magnetic Fields and Rotation," *Astrophysical Journal*, V. 455, p. 536, 1995
- Peimbert, M., Torres-Peimbert, S., and Luridiana, V. "The Effect of Temperature Fluctuations on the Determination of the Carbon Abundances in Planetary Nebulae," *Revista Mexicana de Astronomía y Astrofísica*, V. 31, p. 131, 1995
- Peimbert, M., Luridiana, V., and Torres-Peimbert, S. "Temperature Fluctuations and the Chemical Composition of Planetary Nebulae of Type I," *Revista Mexicana de Astronomía y Astrofísica*, V. 31, p. 147, 1995
- Peña, M., Peimbert, M., Torres-Peimbert, S., Ruiz, M.T., and Maza, J. "Time Dependent Behavior and Physical Conditions of the LMC Planetary Nebula N66," *Astrophysical Journal*, V. 441, pp. 343, 1995

- Pishmish, P., Mampaso, A., Manteiga, M., Recillas, E., and Cruz-González, G. "Morphology, Kinematics and Dynamics of Bulges of Spirals. I. The Galaxy NGC5055," *Astronomical Journal*, V. 109, p. 140-150, 1995
- Raga, A.C., and Cantó, J. "The Initial Stages of an HH Jet-Cloud Core Interaction," *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 51-61, 1995
- Raga, A.C., Taylor, S.D., Cabrit, S., and Biro, S. "A Simulation of an HH Jet in a Molecular Environment," *Astronomy and Astrophysics*, V. 296, pp. 833, 1995
- Raga, A.C., Cabrit, S. and Cantó, J. "Mixing Layers in Stellar Outflows. II. Interfaces Between Two Moving Fluids," *Monthly Notices of the Royal Astronomical Society*, V. 273, pp. 422-430, 1995
- Rodríguez-Gaspar, J., Tenorio-Tagle, G., and Franco, J. "The Disruption of Molecular Cloud Cores by Photoionization," *Astrophysical Journal*, V. 451, pp. 210, 1995
- Rodríguez, L.F., Gerard, E., Mirabel, I.F., Gómez, Y., and Velázquez, A. "Radio Monitoring of GRS 1915+105," *Astrophysical Journal Supp. Series*, V. 101, pp. 173-179, 1995
- Rodríguez, L.F., Anglada, G., and Raga, A. "Radio Continuum Detection of the Exciting Sources of the DG Tauri B and L1551NE Outflows," *Astrophysical Journal Letters*, V. 454, pp. L149-L152, 1995
- Ruelas-Mayorga, A., and Noriega-Mendoza, H. "Luminosity Function for the Stars in the Galactic Bulge. Determination from a Magnitude-Limited Sample," *Revista Mexicana de Astronomía y Astrofísica*, V. 31, pp. 115, 1995
- Salas, L., Cruz-González, I., and Carrasco, L. "Relativistic Electron Energy Spectra of Active Galactic Nuclei in the Thin, Synchrotron Limit. I. The Method," *Astrophysical Journal*, V. 447, pp. 505-511, 1995
- Spinoglio, L., Malkan, M.M., Rush, B., Carrasco, L., and Recillas-Cruz, E. "Normal Versus Seyfert Galaxies in the Bolometric-Flux-Limited 12-Micron Galaxy Sample: Multiwavelength Energy Distribution and Bolometric Luminosities," *Astrophysical Journal*, V. 453, p. 616-633, 1995
- Sulentis, J.W., Marziani, P., Dultzin-Hacyan, D., Calvani, M., and Moles, M. "First Direct Comparison of HIL and LIL Kinematics in AGN," *Astrophysical Journal Letters*, V. 445, pp. L85, 1995
- Taylor, M., Finley, J.P., Kurt, C., and Koenigsberger, G. "Optical Photometric Variability of 2S0144+65," *Astronomical Journal*, V. 109, pp. 396-400, 1995
- Taylor, S.D., and Raga, A.C., "Molecular Mixing Layers in Stellar Outflows," *Astronomy and Astrophysics*, V. 296, p. 823, 1995
- Terlevich, R., Tenorio-Tagle, G., Rozyczka, M., Franco, J., and Merlich, J. "The Starburst Model for AGN II. The Nature of the Lag," *Monthly Notices Royal Astronomical Society*, V. 272, pp. 198, 1995
- Vázquez-Semadeni, E., Passot, T., and Pouquet, A. "A Turbulent Model for the Interstellar Medium I: Theshold Star Formation and Self-Gravity," *Astrophysical Journal*, V. 441, p. 702, 1995
- Vázquez-Semadeni, and Gazol, A. "Gravitational Instability in Turbulent, Non-Uniform Media," *Astronomy and Astrophysics*, V. 303, pp. 204, 1995
- Voitsekhovitch, V., "Outer Scale of the Turbulence: Comparison of Different Models," *Journal of the Optical Society of America*, V. 12-6, pp. 1346-1353, 1995
- Voitsekhovitch, V. "Phase-Retrieval Problem and Orthogonal Expansions: Curvature Sensing," *Journal of the Optical Society of America*, V. 12-10, pp. 2194-2202, 1995
- Voitsekhovitch, V., and Cuevas, S. "Adaptive Optics and the Outer Scale of Turbulence," *Journal of the Optical Society of America*, V. 12-11, pp. 2523-2531, 1995
- Zucker, D.B., Raymond, J.C., Silver, A., Mason, P., Curiel, S., Vrtilik, S., and Schlegel, E. "Phase-Resolved IUE and Optical Observations of the Polar by Camelopardalis," *Astrophysical Journal*, V. 449, pp. 310-319, 1995