EXPLORING THE ORIGINS OF OUR SOLAR SYSTEM: AN RIT-GRENoble PARTNERSHIP

Joel Kastner, Professor

Chester F. Carlson Center for Imaging Science
School of Physics & Astronomy
Director, Lab for Multiwavelength Astrophysics

Rochester Institute of Technology
A Bit of Background

• My international collaborations began as a graduate student at UCLA
  – Initiated longstanding ties with the Institut de Planetologie et d’Astrophysique de Grenoble (IPAG) in France
  – Particularly memorable observing trip to Spanish Sierra Nevada!

• Early professional experiences amplified my initial positive student experiences
  – Collaborative visits to Grenoble
  – Observing trips to Chilean Andes, Spain
  – International conferences in France, Chile

• Became clear to me that astrophysics is a global enterprise
  – Most major observing facilities, regardless of their host nation, invite proposals from researchers spanning the entire globe
  – Major journals, regardless of their host nation, are also international in scope
  – With few exceptions, major new astrophysics research initiatives require international participation

• I spent my sabbatical year (2007-08) in Grenoble
  – French Visiting Fellowship, at the invitation of Dr. Thierry Montmerle (then IPAG Director)
    • TM now Secretary General of the International Astronomical Union
  – An immersion experience for the entire family!

• All of my research teams include extensive international involvement
THE CHANDRA X-RAY SURVEY OF PLANETARY NEBULAE (CHANPLANS): PROBING BINARITY, MAGNETIC FIELDS, AND WIND COLLISIONS


1 Center for Imaging Science and Laboratory for Multiwavelength Astrophysics, Rochester Institute of Technology, 54 Lomb Memorial Drive, Rochester, NY 14623, USA; jhjk@cis.rit.edu
2 Department of Astronomy, University of Washington, Seattle, WA, USA
3 Department of Physics and Astronomy and Macquarie Research Centre for Astronomy, Astrophysics and Astrophotonics, Macquarie University, Sydney, NSW 2109, Australia
4 South African Astronomical Observatory, P.O. Box 9, Observatory, 7935, South Africa
5 Southern African Large Telescope Foundation, P.O. Box 9, Observatory, 7935, South Africa
6 Jet Propulsion Laboratory, California Institute of Technology, MS 183-900, Pasadena, CA 91109, USA
7 Department of Physics and Astronomy, University of Rochester, Rochester, NY, USA
8 Department of Astronomy, University of Illinois, Champagne-Urbana, IL, USA
9 Instituto de Astrofísica de Asturias, Glorieta de la Astronomía s/n, Granada 18008, Spain
10 Instituto de Astronomía, Universidad Nacional Autónoma de México, Campus Ensenada, Apdo. Postal 22860, Ensenada. B. C., Mexico
11 School of Physics and Astronomy, University of Manchester, Manchester M13 9PL, UK
12 Department of Physics, Technion, Israel; soker@physics.technion.ac.il
13 Observatorio Astronómico Nacional, Apartado 112, E-28803, Alcalá de Henares, Spain
14 Instituto de Astrofísica de Canarias, E-38200 La Laguna, Tenerife, Spain
15 Departamento de Astrofísica, Universidad de La Laguna, E-38206 La Laguna, Tenerife, Spain
16 Center for Computational Relativity and Gravitation, Rochester Institute of Technology, Rochester, NY 14623, USA
17 Australian Astronomical Observatory, PO. Box 296, Epping, NSW 2121, Australia
18 Leibniz Institute for Astrophysics Potsdam (AIP). An der Sternwarte 16, D-14482 Potsdam, Germany
19 Columbia Astrophysics Laboratory, Columbia University, New York, NY 10027, USA
20 Department of Physics and Astronomy, University of Denver, Denver, CO 80208, USA
21 Departamento de Física Teórica, Universidad Autónoma de Madrid, Cantoblanco 28049 Madrid, Spain; eva.villaver@uam.es

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ABSTRACT

We present an overview of the initial results from the Chandra Planetary Nebula Survey (CHANPLANS), the first systematic (volume-limited) Chandra X-Ray Observatory survey of planetary nebulae (PNe) in the solar neighborhood. The first phase of CHANPLANS targeted 21 mostly high-excitation PNe within ~1.5 kpc of Earth,
A good omen for a sabbatical year ...

Our *first* evening in Grenoble: the view from our apartment
...a sampling of the sights (and foods) in and around Grenoble...
OVPR Global Partnership Program: A Pilot RIT/IPAG Astrophysics Research Exchange

• Science theme: the formation of planetary systems around young stars
• Collaborative focus: build long-term ties between students & researchers at the two institutions
• Initial program: RIT to IPAG, July 2013
  – J.K. plus AST PhD students Valerie Rapson & Dave Principe visited Grenoble for one week
  – Gave joint seminar for IPAG young star researchers
  – Held science meetings with various IPAG staff & students
  – Sampled life in Grenoble & environs!
• Next phase: IPAG to RIT
  – Dr. Pierre Hily-Blant & student
  – Target: spring 2014
So, last summer, it was back to Grenoble...
Science theme: the formation of planetary systems around young stars
Valerie & Dave: snapshots from their (Grenoble-furthered) PhD research

Spectroscopy of the Nearby Pre-main Sequence Binary TWA 30

David Principe
Astrophysical Sciences and Technology Ph.D. Student
Rochester Institute of Technology

Abstract

We use contemporaneous multiwavelength observations to study two of the nearest known examples of accreting, pre-MS star systems, TWA 30 A and B, have masses just above the brown dwarf regime orbited by circumstellar disks viewed nearly edge-on, with evidence for collimated stellar outflows. TWA 30 A and B display highly variable near-infrared excesses. We present contemporaneous XMM-Newton X-ray observations with VLT XSHOOTER UVB spectra to investigate variability, magnetic activity, circumstellar gas to dust ratios. We measure variable near-IR excesses that are consistent with previous X-ray spectral fitting of TWA 30 A resulted in a X-ray flux of $F_X \sim 3.1 \times 10^{-14}\text{erg s}^{-1}\text{cm}^{-2}$, column $N_H \sim 1.5 \times 10^{21}\text{cm}^{-2}$ and plasma temperature of $T_X \sim 19\text{MK}$. Soft X-ray excess, usually attributed to accretion shock emission, was not detected. Magnetic activity, as probed by log($L_{\alpha}/L_{bol}$) $\sim 1$, is characterized and shown to have decreased since a previous ROSAT measurement 20 years ago. 0 B was not detected and an upper limit of $F_X \sim 6.1 \times 10^{-13}\text{erg s}^{-1}\text{cm}^{-2}$ was estimated. VLT IFU spectra were analyzed to estimate disk dust mass and, combined with XMM-Newton spectra, are the gas to dust ratio in the circumstellar disk of TWA 30 A. We measure a gas to dust ratio of $10^{20}\text{mag}^{-1}\text{cm}^{-2}$ which is approximately 1% of that of the ISM, implying the circumstellar disk of 0 A is deficient of metals.
Your OVPR $$ at work...