

Rochester Academy of Science  
P.O. Box 92642  
Rochester, NY 14692-0642  
Change Service Requested

NON-PROFIT ORG.  
U.S. POSTAGE  
**PAID**  
ROCHESTER, N.Y.  
PERMIT NO. 220

Rochester Academy of Science  
**BULLETIN**



"An organization of people in the Natural Sciences"

February, 2007 - Vol. 61, #2

February, 2007 - Vol. 61, #2, Page 4

ABOUT THE **ACADEMY** - The Rochester Academy Of Science, Inc. is an organization which has been promoting interest in the natural sciences since 1881, with special focus on the western New York state region. Membership is open to anyone with an interest in science. Dues are minimal for the Academy, and are listed in the membership application. Each Section also sets dues to cover Section-related publications and mailings.



For applications and/or more information contact membership chairman Stephen Busschaert, 54 Keswick Rd., Rochester, NY 14609; by telephone 288-5683; or by e-mail <sbusschaert@msn.com>.

The *Academy* Internet web page is <http://www.rasny.org>

The *Astronomy Section* Information phone number is (585) 987-5330. The *Astronomy Section* Internet web page is <http://rochesterastronomy.org>

This "**BULLETIN**" is produced monthly, *except July and September*, by the *Astronomy Section, Rochester Academy of Science*. The editor is Frank Bov, 16 Gladbrook Rd., Pittsford, NY 14534 Phone (585) 422-9910 (days) and (585) 385-1518 (evenings), e-mail <frank.bov@xerox.com>

**ROCHESTER ACADEMY OF SCIENCE OFFICERS**

		Phone	
		(585)	home work
Matthew P. Sinacola	President	426-0815	340-2315
Stanley Spector	Vice President	461-1272	461-1272
Helen D. Haller	Secretary	387-9570	
William Hallahan	Treasurer	624-1628	389-2552
Stephen Busschaert	Membership	288-5683	
Karen Wolf	Anthropology	670-9709	273-4500
Carol Latta	Astronomy	392-7241	
Karen Wolf	Life Sciences	670-9709	273-4500
Linda Heffron	Fossil	461-4179	
Charles Hiler	Mineral	924-7496	
TBD	Ornithology		
Elizabeth Pixley	Herbarium	334-0977	
Jutta Dudley	Publications	385-2368	
Frank Bov	Bulletin	385-1518	422-9910
William Hallahan	Student Grants	624-1628	389-2525
Paul Dudley	Web Site Coordinator	385-2368	
Dan Krisher	Director '09	293-9033	
Frank Bov	Director '09	422-9910	385-1518
Kym Pocius	Director '07	(cell) 802-8566	
Karen L. Wolf	Director '07	670-9709	273-4500
Jutta Dudley	Director '08	385-2368	
William F. Rapp	Director '08	248-2617	

The Academy Postal address is P.O. Box 92642, Rochester, NY 14692

**RMSC DISTINGUISHED  
SCHOLAR LECTURE**

*Planet Formation in the  
Dusty Disks Around Young  
Stars: NASA's Spitzer Space  
Telescope Views the  
Universe*

Dan Watson  
University of Rochester

Wednesday, February 21, 7:30PM  
Eisenhart Auditorium

Launched in 2003, the revolutionary NASA Spitzer Space Telescope is the infrared member of a constellation of satellite observatories. Hear highlights of this revolutionary space telescope's findings so far, including startling new insights into the origins of stars and planetary systems.

Dan Watson is Professor of Physics and Astronomy at the University of Rochester and a leading member of the team that designed, built, and now uses the NASA Spitzer Space Telescope.

Tickets are \$15 for non-RMSC members, \$8 for students through grade 12 or college students with ID. Call (585)697-1942 for more information and reservations.

**ARCHAEOLOGICAL  
INSTITUTE OF AMERICA  
LECTURE**

*High Tech and High  
Stakes: Naval Warfare in  
Hellenistic Times*

Dr. William M. Murray  
Department of History, University  
of South Florida at Tampa

Thursday, February 22<sup>nd</sup>, 7:30 PM  
Memorial Art Gallery

Ancient naval power was used to forge and defend empires in the century following Alexander the Great. A kind of naval arms race eventually produced vessels that carried more men than a modern aircraft carrier and measured more than a football field in length. Archeological evidence from underwater excavations, campsites and the results of sonar surveys have provided Dr. Murray with great new material for his fascinating interpretations. His talk will show how deadly serious this development of fighting vessels was, as Alexander and his successors went to extremes to build larger and larger warships.

**ABSTRACTS OF SOME  
PAPERS GIVEN AT THE  
2006 PAPER SESSION**

**A HUMAN MAXILLA  
TROPHY FROM OAXACA  
MEXICO**

William N. Duncan<sup>1</sup>, Christina Elson<sup>2</sup>, Charles Spencer<sup>2</sup>, Elsa Redmond<sup>2</sup> <sup>1</sup>Department of Anthropology, St. John Fisher College, Rochester, NY <sup>2</sup>Division of Anthropology, American Museum of Natural History, New York, NY

A left human maxilla was found in a surface collection adjacent to a looted tomb from the Preformative (2500 B.C. – A.D. 200) Los Mogotes site in Oaxaca, Mexico. The maxillas as cut anterior-posteriorly approximately at the plane of the inferior border of the nasal aperture. This treatment is identical to the human maxillae found in necklaces worn by sacrificed victims at the site of Teotihuacan in central Mexico, but it is the first such trophy made from human remains from Oaxaca. In this paper we describe the maxilla and its manufacture, and discuss the meaning of taking human maxillae and mandibles as trophies in Mesoamerica. Specifically we argue that such

trophy taking was a way of appropriating the animating essences (soul-stuff) of enemies.

\* \* \*

### WHY USE RED LIGHT AT NIGHT

Frank Bov, Pittsford, NY

The human visual system responds to an extraordinarily wide range of light intensity. In this literature review, key aspects of the eye's light and dark adaptation characteristics are discussed. Drivers of human visual sensitivity result from the eye's physiology as much as its chemistry, and an integrated model explains why red light is universally used by those, such as amateur astronomers, who must read in the dark.

\* \* \*

### STABILITY OF PLANETARY ORBITS

Ingo H. Leubner, Ph.D.  
Rochester Institute for  
Fundamental Research  
Crystallization Consulting.  
Penfield, NY.

Planetary orbits are not stable but increase with time. At the beginning of the solar system, all planets were closer to the Sun than presently, and they will be more distant in the future. The cause is the relative instability of the planetary orbits and the solar mass and gravity loss by radiation and solar wind.

The potential energy of planetary orbits, relative to the solar escape energy (escape velocity), determines the stability of planetary orbits. Applying

fundamental physical concepts, the planetary potential energy relative to the solar surface was obtained by calculating the launch energy (~launch velocity) that is necessary to move an object from the solar surface to the planetary orbit ('planetary launch velocity'). The launch energy is equal to the planetary potential energy relative to the solar surface. They range from 613.830 km/s for Mercury to 617.526 km/s for Pluto. The difference between the solar escape velocity of 617.547 km/s and planetary launch speeds ranges from 3.7 km/s (0.6%, Mercury) to 0.037 km/s (0.006%, Pluto). The launch velocity of the furthest planet (UB313) is calculated to 617.526 km with a solar attachment of 0.0034%.

The gravitational interaction between Sun and planets decreases with time since the Sun continuously loses mass and gravity by solar radiative and solar wind mass loss. This reduces the solar – planetary orbital potential energy. Changes of planetary orbits with time were calculated based on the total solar mass-loss rate constant. At the beginning of the solar system (~4.5byrs), all planetary orbits were closer to the Sun, and orbital periods are increasing. The data correctly predict that Mars changed from liquid to frozen water about 3.6 billion years ago. The model is the only one to predict the observed movement of the Earth away from the Sun.

The planets will escape the solar system when the solar escape velocity decreases below the planetary potential energy (launch

velocity). The planetary escape time is calculated for the current solar mass loss rate to 1.3 and 0.76 billion years for Pluto and UB313, respectively. Present orbital separation rates and orbital period increases are predicted, which are within the range of experimental observation.

\* \* \*

### THE IMPACT OF IMPERVIOUS SURFACES IN THREE WATERSHED CATCHMENTS

G. Kanellis, W. Hallahan.  
Nazareth College, Rochester, NY.

The primary goal of this project is to perform a comparative measure of the effectiveness of greenspaces on the stream ecology they are designed to protect. The town of Pittsford has identified a number of greenspace preserves designed to buffer the impact of housing developments and reduce the expense of providing municipal services to the homes. Several of these greenspaces provide riparian habitat along headwaters of the east branch of Allen Creek. For this project, we compared streams in Pittsford greenspaces, Irondequoit Creek at Main Street, Fishers, representing minimal impact and Allen Creek in Henrietta, representing minimal preservation of riparian habitat. Measurements included impervious surface area and water quality: water chemistry, vegetation and macroinvertebrate diversity indices. The results demonstrate that greenspaces are effective in reducing the impact of housing on stream water quality.

## EVENTS for FEBRUARY 2007

(For updates to Academy events, check the Academy web site, <http://www.rasny.org>, or appropriate Section web site.)

### Fri 2 ASTRONOMY GENERAL MEETING

7:30 PM Rochester Institute of Technology, Gosnell Hall, room A300. Join us at RIT for this month's general meeting. This month's talks: TBA Visitors are always welcome. Come as early as 7:00 PM for pre-meeting snacks and conversation or plan to go out afterwards with us. For information, contact Carol Latta at 230-9548, or by e-mail at <cosmos@rochester.rr.com>.

### Tue 6 FOSSIL MEETING

The Fossil section hosts the Central New York Paleontology meeting at the Community Meeting Room, Brighton Town Hall. Featured speaker will be H. David Sheets, Chair, Department of Physics, Canisius College. This meeting will be held CNY Paleo-style with pizza and socializing at 6:30 PM and speaker at 7:00 PM. Please RSVP to John Handley at <jhandley@rochester.rr.com> or 585 802 8567 for a pizza head-count.

### Thur 15 RAS BULLETIN

Articles and event notices due for the March, 2007 newsletter.

### Wed 17 RAS BOARD MEETING

7:00 PM Brighton Town Hall, Stage Conference Room. (May be temporarily rescheduled due to conflicts with the RMSC Distinguished Scholars lecture series.)

### Wed 17 DISTINGUISHED SCHOLAR LECTURE

7:30 PM in the Eisenhart Auditorium at the RMSC. Dr. Dan Watson of the University of Rochester will speak on: "Planet Formation in the Dusty Disks Around Young Stars: NASA's Spitzer Space Telescope Views the Universe." Tickets are \$15 for non-RMSC members, \$8 for students. Call (585)697-1942 for more information and reservations.

### Tue 20 MINERAL MEETING

7:30 p.m. at the Brighton Town Hall, 2300 Elmwood Ave., Rochester, NY in the downstairs Community Meeting Room. The program will be a review of the 2007 Tucson show. Refreshments. Visitors are welcome. For information, call Chuck Hiler at 924-7496 or check the Mineral Section Web page for possible updates

### Wed 21 LIFE SCIENCES HERBARIUM WORKSHOP

10:00 AM to 2:00 PM: RAS Herbarium, located in the basement of the Rochester Museum and Science Center (RMSC). Many activities available, no experience needed! Come help us with this valuable collection, and learn about plants in the process. For more information, contact Elizabeth Pixley, herbarium curator at <epixley@rochester.rr.com> or 334-0977 ). Please RSVP if you

plan to attend.

### Thur 22 ANTHROPOLOGY LECTURE

7:30 PM in the Memorial Art Gallery Auditorium. The Archaeological Institute of America, Rochester Society, will present Dr. William M. Murray, Department of History, University of South Florida at Tampa, will speak on: *High Tech and High Stakes: Naval Warfare in Hellenistic Times*.

### Tue 27 LIFE SCIENCES MEETING

7:00 to 9:00 PM The Section will have a slide presentation by Elizabeth Pixley on South Africa, with information on ecology, plants and animals. Current information on the HIV/AIDS pandemic in southern Africa, including S. Africa, Swaziland and Mozambique will also be presented. The meeting will be at Karen Wolf's, 1397 Five Mile Line Road, Penfield. For more information, call Karen (670-9709) or Elizabeth Pixley (334-0977). All are welcome to attend.



Calcite & Fluorite – China