
SPRING 2006
VOLUME 29, NO. 1

★

MIRA

NEWSLETTER



Sunrise in the Snow on Chews Ridge

Photo by Ivan J. Eberle

Contents

Calendar	2
2005 MIRA Donors	2-3
Q&A	4
The MIRA Eclipse Cruise	5
The Spring Sky	6-7

Calendar of Events

Sunday, 11 June, 2:30-4:00pm Free tour of MIRA's Oliver Observing Station on Chews Ridge. Open to the public. Reservations are required; please call 883-1000.

The Monterey Institute for Research in Astronomy gratefully acknowledges memberships and gifts for 2005 from individuals, families, corporations, and foundations.

**2005 Associates Circle
(\$2,500 and over)**

Arthur & Barbara Babcock
Susan Griffith
Kenneth Lafferty Hess
Family Charitable Foundation
Gordon Jones
Dorothy Largay & Wayne Rosing
The Ralph Knox Foundation
Sandra & Bruce Weaver

2005 Associates (\$1,000-\$2,499)

Kenneth & Gabrielle Adelman
Homer L. Bosserman
Debra & Max Gramespacher
Mrs. Richard W. Hamming
Mr. & Mrs. Herbert Hoover, III
Patrick & Susan Jones
Dave Buckingham & Constance Murray
Hazel Ross
Whitney & Clasina Shane

2005 Patrons (\$500-\$999)

Laura Zehm & Paula Black
James D. Carroll Sr.
Professor James Eagle
Roy Dean Hardy
Monterey Insurance Agencies
Monterey Peninsula Volunteer Services
Colin & Hilary Ross
The Upjohn California Fund
Yellow Brick Road Benefit Shop

2005 Sustaining (\$250-\$499)

Dr. Kyle T. Alfriend
Drs. Craig & Lynne Chester
William W. Drake
Robert J. Hawley
Dr. & Mrs. Robert L. Kellogg
Dennis & Susan Mar
Charlie & Anne Oostdyk
Kathy Izumi & Chris Oze
George & Adriana Roberts
Ray Meeker & Deborah Smith
Robert Webb

2005 Sponsors (\$100-249)

Michael Anderson
Bob & Rita Bogardus
Albert M. Bottoms
Dr. & Mrs. Robert Chapman
George Chester
Craig & Theresa Cholar
Patti Compton
Susan B. Creveling
Dale E. Ditsler
Robert & Dale Forrest
Christopher Fulton
Marion Getz
Ralph Carmichael & Lorene Hall
Peter Willcox & Jo Hathcock
Thomas E. Haven
Mr. & Mrs. Edgar G. Lehmann
Mr. & Mrs. Gary Love
Margaret L. McCrary
James McIntosh
Mitteldorf Family Trust
Mr. & Mrs. C.N. Mooers
James Neeland

George Nicolayev
Anton Prange
Mr. Robert R. Read
Trevor Roberts
Carol A. Ryan
Scott & Marcia Sage
Eugene Salamin
Dick Baumgartner & Liz Salzer
Allyn Saroyan
Marcia J. Smullen
Randall Enger & Evelyn Tate
The Justin Dart Family Foundation
Vendavo, Inc. (Kitzi Tanner)
Franklin Smyth & J. Patrick Waddell
Richard Weiss
Margaret E. Welliver
John L. Whittenberger
Karlheinz Woehler
John & Sandra Zasio
Marsha McMahan Zelus

2005 Family (\$50-\$99)

Brian Ashurst
Susan Rautine & Gene Barnes
Mezola & Ed Benton
John Bergez
Dr. & Mrs. Robert Black
Jennifer Bliss
Sue & Jeff Braff
Mr. & Mrs. Theodore Calhoun
Jo Ann Novoson & Carl Christensen
Pete Sole & Nancy Collins
Bobbi & Spencer Critchley
Eugene & Martha Crittenden
Bill & Beth Crockett
William Denholm
W.A. Edson

James Esary
 William Falor
 Sean & Rebecca Flavin
 Joe Lee Frank III
 Steve Hillman
 Stewart & Pil Yim Hobson
 Lisa & Tom Hoivik
 Ted & Sue Hooker
 Joe & Liz Houston
 Maj. & Mrs. Edward Isajewicz
 Mr. & Mrs. Robert Jones
 John Kochis
 Kenneth P. Lange
 Eugene & Karen Leydiker
 Dr. Gary Mechler
 Col. Nathaniel Mewhinney
 Joanne Millard
 Mr. & Mrs. Antonio Nafarrate
 Linda Newton
 Peter & Carol O'Brien
 Dr. Sidney Parsons
 Mr. & Mrs. John Pratt
 Elizabeth Rogers-Monighetti
 Alan & Lyn Rosen
 Jean L. Rowell
 Erica Scheidt & David Scardina
 Dr. & Mrs. Arthur Schoenstadt
 Dr. & Mrs. Rex Shudde

Linda Sinclair
 Patrick J. Skinner
 Tod Spedding
 Hugh & Phyllis Steven
 Jane Stile
 Morgan C. Taylor
 William & Maria Thompson
 Mark Trueblood
 David & Susan Wadleigh

2005 Members (up to \$49)

Donald Berry
 Laura Brisby
 Holly M. Carson
 Elizabeth Christian
 Shirley P. Chute
 Estelle Douglas
 Richard & Janice Elster
 Mrs. Mary Fry
 Patricia Gilda
 Kirk Goldberg
 Glen Grossman
 Burnett Hartsock
 Danny Jokelson
 Francis P. Lloyd
 Jean Lovell
 Gerald MacKenzie

Dr. & Mrs. Arnold Manor
 Phillip Mattingly
 Art McDole
 Robert McIntyre
 Mr. & Mrs. Lee Mellinger
 Bruce Mendenhall
 Gordon & Jeanne Nakagawa
 Ray Newburn
 George Niesen
 Mr. Larry Omoto
 Jana Osato
 Andrea Polanco
 Mr. Donald Roy
 Mr. & Mrs. Victor Selby
 Richard A. Siquig
 Hugh Smith
 David P. Smith
 Mr. & Mrs. Anthony Taormina
 Dr. Robert Turner
 Gary Ulrich
 Marilyn Uribe
 Mrs. Cecil Wahle
 John & Bonnie Whisler
 Nancy Wilson
 Oscar B. Wilson
 Lee Winger

Our Far-flung Correspondents



MIRA Director Dr. Wm. Bruce Weaver takes time out from eclipse-watching to visit the Giza Plateau.



*The MIRA expedition to the solar eclipse of 29 March 2006.
 See the article by Dennis Mar on page 4.
 (Costa Classica photo)*

The MIRA Eclipse Cruise

by Dennis Mar

We are in the middle of the Mediterranean Sea to do our part: lat. 33°10'N by long. 26°39'E. All the pieces must come together in alignment: the sun, the moon, the earth, the weather, and the observer. They did so on March 29, 2006, and we were treated to a majestic total eclipse of the sun.

Twenty-two members of the MIRA travel group were aboard the Costa Cruises's ship *Classica* to tour ancient wonders and observe a phenomenon that must have stunned the ancients too. On the day of the eclipse, the ship's captain sailed the ship away from the southern Turkish coast and found absolute clear skies overhead. Right before totality, the captain reduced the ship's speed to five knots to provide the steadiest viewing platform he could. The ship had enough deck space for everyone to observe comfortably.

I recorded first contact at 12:25 pm. Through protective glasses, you could see the slightest edge of the sun being obscured.

The image of the sun became a thinner and thinner crescent as totality approached. It is unsafe to observe the sun directly except during totality. People used specially manufactured glasses to view the progress of the eclipse from first contact to totality. Or you could put special dark filters on your optical equipment. Rod Norden and Kris Houser from Scotts Valley lugged a 92mm refractor and tripod with solar filter on the trip and offered people close-up views of the eclipse.

Or with low technology, you could use a pinhole to project an image of the sun on the deck. MIRA president Bruce Weaver showed us how to use our plastic stateroom keys, which were punched with small holes, to display the small crescent sun.

As the time for totality drew near, people were on the lookout for the eclipse phenomena such as the approaching moon's shadow, shadow bands, the "diamond ring effect," and Bailey's Beads. Susan Mar from Monterey didn't see the approaching shadow, but she saw the faraway clouds darken and then the nearer clouds darken. The atmosphere took on an eerie light.

The momentary flash of the diamond ring effect signaled the start of totality. The world changed in an instant. You took off the protective glasses to gaze at totality unencumbered. Where the sun had been was instead a dark spot. The corona streamed into space. From around the deck you heard people cheering, squealing, shouting, and expressing wonder.

In every direction, the low clouds on the horizon showed

reddish sunset colors. Everyone saw Venus near the obscured sun. A few sharp-eyed observers made the rare midday sighting of Mercury, which is usually hidden in the sun's glare.

When totality began, some of us saw two reddish solar prominences through binoculars at the 11 and 12 o'clock positions on the darkened disk. Near the end of totality, two prominences appeared at the 5 and 6 o'clock positions.

The second diamond ring effect marked third contact and the end of totality. Some people put their protective glasses back on and continued to track the moon uncovering the sun. But for the rest of us, the show was over as everyone paused to savor the experience. "Was it really four minutes – the time seemed to pass faster than that," was a common reaction. Someone

joked, "Can we see it again?"

Not all the passengers may have had the same reactions. Some of the eclipse watchers on deck claimed they heard a ping-pong game going on during totality. And since the ship had an Internet café, it was technically possible to have gone to a computer terminal, logged onto the NASA web site, and watch totality on the computer screen in real time with the actual event. Were there people on board so geeky that they would do so?

The non-astronomy portion of the cruise also offered notable sights. We took excursions to Rome, Pompeii, the pyramids of Giza (the pyramids are really, really big!), Cyprus, the island of Rhodes, and the southern Turkish resort city of Antalya. Tour buses clogged the parking lot at the Roman ruins near Antalya. This strip of the Turkish coast would be under the path of totality



The solar corona during totality. (photo by Valérie Desnoux)

and tourists had flocked to this area in anticipation of the next day's eclipse.

After totality and lingering on deck, many of us did what you always did on a cruise ship: looked for food. Since the *Classica* was an Italian ship, the pasta and the prosciutto were excellent. Cory Morse, Genevieve Getman-Sowa, and Rachel Sowa shared a dinner table with Bruce Weaver. Cory said that everyone at the table enjoyed Bruce's requests for specialty desserts.



A door key being used for safe viewing of the partial phase of the eclipse (see text).



Eclipse watchers set up their gear aboard the Costa Classica.



Eclipse viewing devices come in all styles.



Rachel Sowa (l) and Genevieve Getman-Sowa



Urania, the muse of astronomy, portrayed in a mosaic in the Palace of the Grand Masters in Lindos, Rhodes.

Dennis Mar, a statistician with the Naval Postgraduate School, is a past Chairman of the Friends of MIRA-Ed.

The Spring Sky

by Dr. Whitney Shane, MIRA's Charles Hitchcock Adams Fellow

Fixed Stars

We have noted quite regularly in these little essays on the spring sky that what we can best see during this season (weather permitting) is an assortment of galaxies. With so many objects to describe, it is clearly useful to have a system of classification. Since shortly after its introduction in 1926, the Hubble scheme, often called the tuning fork diagram, has been used for this purpose. In the intervening 80 years it has enjoyed many modifications and expansions, but its basic form has remained the same. In a recent review article, Alan Sandage, who should know more about this subject than anyone else, described these developments along with the earlier history of galaxy classification.

Sandage suggests that the classification of galaxies (and many other objects in nature) develops in three stages. First they are sorted, according to what can be observed, into descriptive groups. These groups will not, in general, have any particular relation to one another; they will simply reflect the features that are most evident to the observer. The first person to classify galaxies, long before anyone knew what they were, was William Herschel. He cataloged many non-stellar objects and classified them according to the properties that he could observe, such as apparent size and brightness, central condensation, smoothness, regularity, etc. He had, of course, no way of distinguishing galaxies from other extended objects.

This kind of classification was extended and refined until about 1920, when the second phase of classification began. In this phase the various classes of objects are arranged in some sort of sequence in one or more dimensions, introducing a degree of continuity into the classification. By this time spiral

nebulae were recognized as a separate class of objects, although their true nature was only suspected, and the initial classification scheme (which was not the work of Hubble) contained only the spirals. By the time Hubble introduced his scheme the galaxies were generally recognized for what they were and the elliptical galaxies were also included. The scheme was still based strictly on the morphology of the objects, although the use of the terms "early" and "late" to describe the two ends of the sequence suggested the possibility of an evolutionary sequence, quite incorrectly, as it turned out.

This illustrates the potential danger, which Sandage points out, of letting an uncertain interpretation of the

underlying physics influence the classification scheme. Happily that did not happen here, as the Hubble scheme does not depend upon any assumption about the physics. If it had, it would

have been impossible to use the classifications so derived to verify subsequent physical hypotheses. We would have to call this circular reasoning. Once the physics has been well established, then it is legitimate to use it to refine and expand the classification scheme. This is then the third phase, which, with our increasing understanding of the dynamics and evolution of galaxies, we are only now beginning to enter.

The classification scheme as proposed by Hubble lasted almost unchanged until after his death in 1953. There was some inconsistency in the transition between elliptical and spiral galaxies, where Hubble had introduced a hypothetical S0 type. These galaxies were subsequently identified, and they turn out to form a diverse and complex group, quite different from the simple transition type which was originally

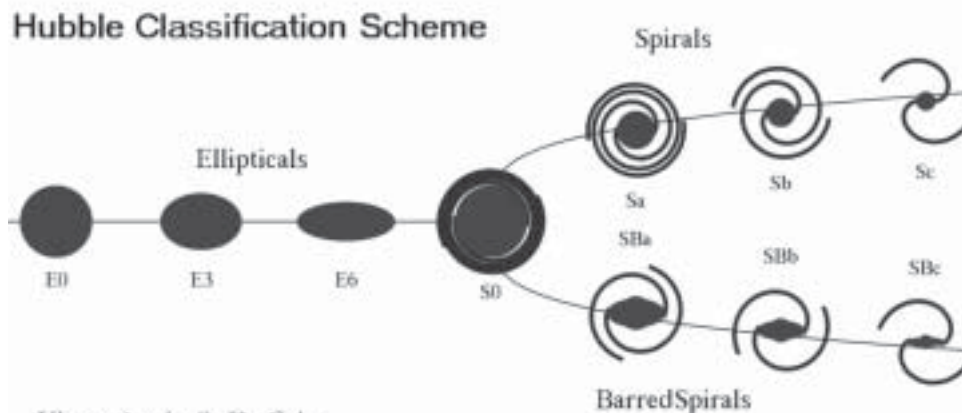


Illustration by S. D. Cohen

assumed. Hubble subsequently made the adjustments needed to remove the inconsistency, but this work was not published until after 1953.

Inevitably, as the observations improved, refinements and extensions were introduced. In particular, de Vaucouleurs expanded the classification of spirals to a fully three-dimensional system by including bars (as had Hubble) and inner rings and their relation with the bars. He even added outer rings, most of which appear to have a tightly wound spiral structure and are of some dynamical significance. One almost has to worry that the classification scheme will become so extensive that there will be only one galaxy in each class. In this case the scheme will become essentially useless and we will have to follow Baade's advice and go back to the pictures themselves. Van den Bergh classified the orderliness of the spiral structure and correlated it with the luminosity. The complexities which we now know to be present in the elliptical galaxies have yet to fully find their way into an accepted classification scheme. But despite all these complications, the original tuning fork diagram remains the basis of our classification scheme for galaxies.

Planets

The quarter began with Mercury briefly visible in the morning sky and ends with its brief presence in the evening sky. In between it has passed inferior conjunction. Neither apparition is favorable for northern observers.

Venus is visible in the morning twilight during the whole three months, but it is not well placed for observation. A lunar occultation on April 24 was visible from parts of the southern hemisphere.

Mars is now moving into the evening sky and after the end of April is no longer well placed for observation. By the end of June it is well into the evening twilight.

Jupiter, which passes opposition on May 4, is easily observable throughout the spring. However, its southerly declination makes this opposition unfavorable for northern observers.

Saturn passed its stationary point in early April and is now moving rapidly into the evening sky. By the beginning of May it is already too low in the west for good observation, although it remains visible in the evening twilight through June.

Uranus, which is not well placed for observation,

is currently undergoing a series of lunar occultations, on April 24, May 21, and June 17. All of these are visible, however, only from far in the southern hemisphere.

Pluto is in opposition on June 16, but the nearly full moon will make observation even more difficult than usual.

Meteor Showers

The Lyrids, which is only a moderate shower, peaked on April 22. The shower is of rather short duration, so they will probably all be gone by the end of the month.

The eta-Aquarids, which peaks on May 6 and has a duration of more than a month, is associated with comet Halley. It is observable in the morning hours and, unfortunately for us, largely restricted to the southern hemisphere.

The June-Boötids, a relatively unknown stream, peaks on June 27. Although it is often not seen at all, it can produce intense outbursts and is worth watching for.

Comets

The brightest comets in the spring sky are the various components of 73P Schwassmann-Wachmann 3. The brightest of these, component C, will pass very close to the earth on May 12 when it should be easily visible with the naked eye and well placed for northern observers. The somewhat fainter component B is expected to reach magnitude 6 during May, while a third component, G, may reach magnitude 10.

Another bright comet, C/2006 A1 (Pojmanski), was brightest in February and is now slowly fading, but it should still be magnitude 10 and well observable throughout the night in May.

The featured comet of the previous quarter, C/2005 E2 (McNaught), has now disappeared into the evening twilight, but it is expected to be back, as a much fainter object, in the fall.

Eclipses

The total solar eclipse of 29 March was studiously observed by a delegation from MIRA. We are informed that everything occurred as predicted, which we find very gratifying. A full report on the expedition is to be found elsewhere in this *Newsletter*. There will be no more eclipses of any sort until the late summer.

Friends of MIRA Membership

I would like to become a Friend of MIRA and receive the quarterly MIRA Newsletter.

Enclosed is my membership donation of \$ _____

In addition, I am making a special contribution of _____

\$2500 Associates Circle \$100 Sponsor

\$1000 Associate \$50 Family

\$500 Patron \$35 Member

\$250 Sustaining \$15 Student

MIRA welcomes corporate and business members. Contributions are tax deductible as allowed by law.

Name _____

Address _____

City, State, Zip _____

Phone/e-mail _____

The MIRA Board of Directors

Gordon Jones, Chairman

Dr. Wm. Bruce Weaver, President

Patti Compton, Secretary

Laura Zehm, Treasurer

Homer Bosserman

Dr. Craig Chester

Gary Love

Welcome to our new Friends

Marian Getz
A. L. Mangelsen
Mr. Donald Roy
Gerard Shea

Thanks!

Staff

Gordon Jones, Chair, Board of Directors
Dr. Wm. Bruce Weaver, Astronomer & Director
Kimberly Postgate, Administrator
Dr. Arthur Babcock, Astronomer & Newsletter Editor
Bill Bishop, Volunteer Systems Administrator
Dr. Craig Chester, Astronomer
Dr. Martin Cohen, Astronomer
Casey Dreier, Researcher
Donna Dulo, Docent
Ivan J. Eberle, OOS Caretaker
Tamara Jamila Homan, Docent
Brian Jacobson, Docent
Holly Keifer, Technician
Tom Lougheed, Docent
Jim Neeland, Volunteer Systems Administrator
Claas Shane, Librarian
Dr. Whitney Shane, Astronomer & Charles Hitchcock
Adams Fellow
Dr. Russell Walker, Astronomer

* * *

The Monterey Institute for Research in Astronomy owns and operates the Oliver Observing Station under permit from the U.S. Dept. of Agriculture-Forest Service.

* * *

The Monterey Institute for Research in Astronomy owns and operates the Richard W. Hamming Astronomy Center and the Ralph Knox Shops through an arrangement with the U.S. Dept. of Education.



Visit our Web site and *Field Trips to the Stars:*
www.mira.org
E-mail us at mira@mira.org

Monterey Institute for Research in Astronomy

200 Eighth Street
Marina, CA 93933

(831) 883-1000
(fax) (831) 883-1031
www.mira.org



NON-PROFIT ORG.
U.S. POSTAGE
PAID
PERMIT NO. 16
MARINA, CA 93933