



## STAR FIELDS

Newsletter of the  
Amateur Telescope Makers of Boston  
Including the Bond Astronomical Club  
Established in 1934  
In the Interest of Telescope Making & Using

Vol. 31, No. 5 May 2019

### This Month's Meeting . . .

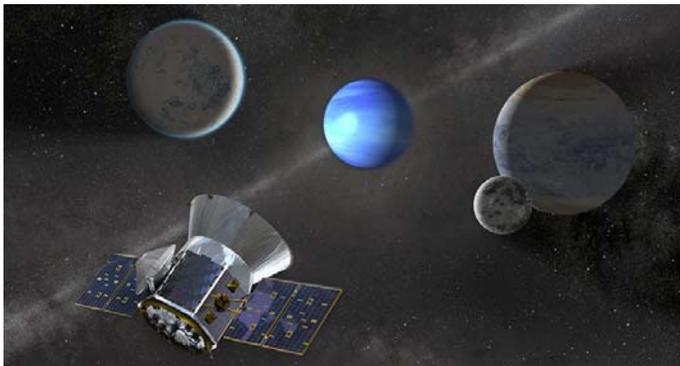
Thursday, May 9<sup>th</sup>, 2019 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at the CfA is allowed for the duration of the meeting

### Transiting Exoplanet Survey Satellite (TESS) Update



TESS rendering. Courtesy NASA and MIT Press

Our guest speaker for the May meeting will be Dr. George R. Ricker. Dr. Ricker will update us on the Transiting Exoplanet Survey Satellite (TESS) mission.

Dr. George R. Ricker is the principal investigator for NASA's Transiting Exoplanet Sky Survey (TESS) Explorer mission, which was successfully launched in April 2018. He is currently the Director of the Detector Laboratory and Senior Research Scientist at the MIT Kavli Institute for Astrophysics and Space Research. Dr. Ricker received his undergraduate degree from MIT in physics, an M.S. in astronomy from Yale University, and a Ph.D. in physics from MIT.

Please join us for a pre-meeting dinner discussion at [House of Chang, 282 Concord Ave., Cambridge, MA.](#) at 6:00 pm before the meeting.

### President's Message . . .

It's gratifying to see that spring has finally sprung in Massachusetts! When the weather gives us a break we can enjoy the trees and flowers underfoot blooming while viewing our spring feast of constellations. Prominent in the night sky from late March to late June are the constellations Ursa Major, Boötes, Leo, Cancer, Virgo and Hydra. This spring I hope to image at least one prominent deep sky object in each constellation using the ATMob Research and Imaging Observatory (ARIO). We now have the option of collecting images using the C14 or Vixen 102SS Apo-refractor which are both mounted on the new Paramount german equatorial mount. As the season progresses, we plan to fine tune the instruments and provide calibration files to make imaging easier. Please reach out to Bruce Berger, Jim Gettys or me if you would like to get trained on the use of the observatory.

Spring has brought on a flurry of effort at the clubhouse. Work continues on the spin grinder and Mirror-o-Matic grinder/polisher. Barry Jensen and Eric Johansson have done a yeoman's job in driving these projects to near completion. They have received a lot of support from other members to make these instruments available to the membership. It's my hope they will be up and running within the next month. Bernie Kosicki is working to organize hand mirror grinding efforts also, so if you have always wanted to grind and polish a mirror, the Clubhouse is the place to be. Please feel free to contact me or Bernie if you would like to discuss a project.

I am interested to hear from the membership regarding our monthly meetings in Cambridge and how things are progressing at the clubhouse. Your feedback is invaluable and always welcome. If you have an idea for a topic you wish to hear, or speaker you believe may be of interest at our monthly meeting, please drop me a note. Do you have ideas for how we can improve the clubhouse experience? I would be very interested to hear.

As outlined in the club bylaws (Article XI), the annual election process for club officers and Members-at Large is fast approaching. We could use your help in this process. Help can come in three forms: running for one of the elected positions, being a member on the Nominating Committee, or casting your vote at the June 13th Annual Meeting. We are a bit behind in that I have received 2 volunteers for the Nominating Committee. We need another member to play a role in the nomination process. Please contact me ASAP if you have any interest. I promise it will be an easy and pain free process this year.

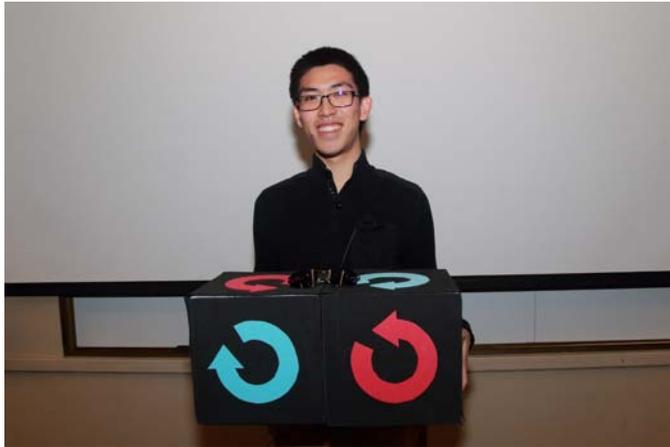
If you have an interest in running for one of the officer or member-at-large positions, the first way to proceed is to have your name put forward by the Nominating Committee at the May meeting, or be nominated from the floor at the Annual Meeting in June, provided that a suitable written notice, containing the name or names of the person or persons to be nominated from the floor at the Annual Meeting, and the signatures of at least seven members, is filed with the Secretary not less than ten days prior to the date of the Annual Meeting. Please contact me via email ([president@atmob.org](mailto:president@atmob.org)) or via phone (617-966-5221) if you have any interest.

~ Tom McDonagh - President ~

## Meeting Refreshment Assignment . . . 2019

May – Al Takeda  
Jun. – Bruce Berger  
July – TBD

### April Meeting Minutes . . .



Calvin Leung \*

Minutes of the 919th ATMoB meeting held April 11, 2019 at the Harvard-Smithsonian Center for Astrophysics in the Phillips Auditorium. Club President Tom McDonagh called the meeting to order at 8:01 pm.

- Secretary John Harrington read the minutes of the March Club meeting.
- Treasurer Eileen Myers gave the Treasurer's report.
- Membership Secretary Chris Elledge presented the Membership Report, showing 329 total memberships covering 429 Club members.
- President McDonagh gave an update on progress with the ATMoB Research and Imaging Observatory (ARIO) and showed an image of M51 taken from it. He invited all Club members to come out and use the upgraded facility.
- Glenn Chaple presented the Observer's Report. Mercury will be at greatest elongation tomorrow morning. Planetary conjunctions with the Moon will occur on April 23rd and 25th. The Eta Aquariid meteor shower will peak on May 6th. This month's Observer's Challenge objects are NGC 2964 and 2968, both fairly bright (11th magnitude) galaxies in Leo.
- Steve Clougherty gave the Clubhouse Report, noting that the March 23rd work party attended by 14 Club members and accomplished much work on the grinding room, now turned into a clean room. President McDonagh and Bruce Berger sorted materials in the ATMoB Research and Imaging Observatory, while Chris Elledge relocated the Clubhouse heaters and Kiera Mooney repainted the optical tunnel. The Mirror-o-Matic machine is almost ready for use!

- Vice President Nugent presented the Outreach Report and noted that the Acton star party for the Girl Scouts went well, especially after the clouds broke up. Upcoming star parties include the Farrington Nature Center on April 13th, Stratton Elementary School in Arlington on May 3rd, and Astronomy Day in Natick on May 11th. He also noted that PopScope would return for impromptu stargazing at the Children's Museum throughout this summer. Finally, he called on Club members to visit the ATMoB Facebook site.

- Old Business:  
President McDonagh stressed that volunteers are needed for the Club's Nominating Committee right now!

Joseph Rothchild has donated proceeds from the sale of his astro gear to the Club.

- New Business: None.

President McDonagh then introduced Calvin Leung, a graduate student at MIT, who spoke on the subject of Testing Quantum Mechanics with Cosmic Photons in the Canary Islands. Calvin opened his presentation by noting that it actually focused on work he did as an undergraduate at Harvey Mudd College. His project focused on testing the concept of quantum entanglement, and his particular goal was to improve "Bell Inequality Tests" to verify the amount of correlation that two particles can have. The underlying physics is that of quantum entanglement between two particles, in which measurement of one particle instantly affects the other, even if the particles are separated by an enormous distance. Calvin analogized the particles to dice held by different players at opposite ends of a casino while still maintaining a connection between them.

To carry out the study, Calvin's team utilized two 4-meter telescopes - the William Herschel Telescope and the Telescopio Nazionale Galileo - located on La Palma, Spain. Each telescope was trained on a different quasar located billions of light-years away. At a station between these two telescopes, the researchers generated thousands of pairs of seemingly entangled photons and used a beam splitter to send one member of each pair to a detector at each telescope. As the entangled photons traveled to the detectors, the telescopes analyzed light from the distant quasars and determined whether the light was more red or more blue than the baseline, eliminating any influence of the experimenters over the measurement. Depending on the resulting quasar color measurement, the entangled-photon detectors automatically adjusted the angle of their polarizers, varying the type of measurement performed on each member of the paired photons they had previously generated. The randomness of the two types of measurements - determined only by the ancient quasar light - allowed the researchers to test whether or not the photon pairs were truly linked to one another.

Calvin's goal was to use photons from the two widely-separated quasars to generate random measurements of the paired photons generated by his team. Because these measurements were determined by quasar light that emerged billions of years ago from the quasars, they are guaranteed to be causally

independent of any terrestrial events. Over the course of two 15-minute experiments (each utilizing two different pairs of quasars), the researchers measured over 17,000 and 12,000 pairs of entangled photons, respectively.

The result was that Calvin's team observed that thousands of their paired photons were indeed entangled, a statistically significant violation of Bell's inequality to a very high certainty (9.3 standard deviations) and something that cannot be explained by classical physics. This experiment, by letting the quasars in effect randomly choose how to measure each member of a pair of entangled photons, also closed off the so-called "Freedom of Choice" loophole. That loophole had suggested that a hidden variable could influence how an experimenter decided to measure seemingly entangled particles, causing the particles to appear correlated when they actually were not.

Calvin's experiment succeeded despite a very random, uncorrelated event - a windstorm that flipped over the shipping container that housed the beam splitter!

President McDonagh thanked Chris Elledge for providing the refreshments, and then adjourned the meeting at 9:39 pm.

~ *John Harrington, Secretary* ~

## Meeting Recordings . . .

The recording of ATMoB meeting #919 is available on YouTube: <https://youtu.be/3L206nrths>

I would like to thank Calvin Leung for giving his presentation and allowing us to record it.

This link is to the publicly available cut of the meeting recording. To view the original version of the meetings, please see the Announce Forum on the ATMoB Website <https://www.atmob.org>.

~ *Chris Elledge - Membership Secretary* ~

## Membership Report . . .

I am pleased to welcome our newest members Gil, Sophia and Victoria Irizarry, and Carolina Buitrago.

As of April 22nd, 2019 we have 332 memberships covering 438 members. This is broken down as follows:

- 153 Regular Members
- 107 Senior Members
- 8 Student Members
- 59 Family Memberships covering 165 Members
- 3 Guest Members
- 2 Honorary Members

~ *Chris Elledge - Membership Secretary* ~

## Clubhouse Report . . .



(L-R) Joe Dechene and Eric Johansson working on the new grinding machine \*

The Clubhouse was opened by 9:30 am under cloudy skies and a temperature of 66 degrees. Many members drove to the Clubhouse through heavy rain. Twenty three members volunteered their Saturday for this April 20th Work Session. We thank the following: Bruce Berger, John Blomquist, Nico Carver, Paul Cicchetti, Steve Clougherty, Joe Dechene, Barry Jensen, Eric Johansson, Dick Koolish, Bernie Kosicki, John Maher, Tom McDonagh, Vladislav Mlch, Keira and Corey Mooney, Eileen Myers, Dave Prowten, John Reed, Phil Rounseville, John Stodieck, Art Swedlow and Al Takeda.

Dick K again donated a parcel of needed screw drivers and pliers. Thank you, Richard.

John S and Paul C removed the snow stakes, bundled them, and stored same in the far barn.

Dave P installed a movable door section to the new polishing room plastic segmented curtain giving easier access to that area. Barry J and Tom M spent most of the day assembling and fitting components to the Mirror-O- Matic mirror machine. Eric J spent his day continuing the creation of a spin mirror making machine from the ashes of our unused powered mirror making relics.

Work continued in the ATMoB Research and Imaging Observatory (ARIO) by Tom M and Bruce B. Bernie K spent his day identifying surplus mounts and telescopes for release for future member acquisition.

John B monitored the machine shop. He assisted Slav M with his machining project, and solved other machining problems throughout the day.

John Reed led members on a focused and thorough search for all the pieces of the Club's first Dobsonian telescope. This scope was originally constructed and stored in Dennis DiCicco's Watertown apartment (as the story goes). The Dob was used throughout the 70's and 80's. The optical tube was long (but segmented), with a full thickness 16-inch Coulter mirror donated by a member. This scope had a unique jet engine thrust bearing for the azimuth motion.

After years of hauling this one of a kind scope to star parties, Stellafane, Boston Common, and displayed at the Burlington Mall ATMoB booth, it resided in the Chase Memorial Hutch, until the telescope was replaced by the Coulter thin mirror 17-inch Dob donated by Mr. Wray.

We found the primary mirror in Paul Varella's workshop awaiting further figuring, but need the collective club memory to help us find the 4+” minor axis secondary mirror, the finder scope, eyepiece(s), the jet engine thrust bearing, and any unknown pieces. **PLEASE HELP US COMPLETE THIS SEARCH.** It is considered the first altitude/azimuth mounted telescope on the East coast, and may move to New Mexico's Telescope Lyceum, along with an ATMoB history documenting this museum piece. It would join other historical telescopes displayed under the curatorship of former ATMoB member John Briggs.

All hands present helped move pieces from the Clubhouse attic, metal shed, basement, and everywhere in between, to a staging area for John Briggs. While there is some water and mouse damage to the parts found, we will estimate the re-build effort this week when John Briggs visits the Clubhouse. This effort led to the cleanup of the metal barn by John S, and reseeding of driveway edges with remaining grass seed found in the mouse eaten bags. And the lawn is turning a lovely shade of green. The snow blower has been moved to the far barn.

We will need help at the next work party to insure the mowers and weed whackers are in working order.

Lunch was provided by Eileen M. Other members helped with the prep and setup of the table. The menu was baked chicken, veggie casserole and salad, with fresh fruit pieces for dessert. The home cooked meal was enjoyed by the many hungry members.

Work continued until nearly sunset. We could not observe due to continuing rain showers. No sign of clearing skies provided for an early closing time after a full day's work. Thanks to everyone for your efforts. Next Clubhouse Work Session is full Moon Saturday, May 15th. Mark your calendar and join us.

**Important Notice: Please check your email on the ATMoB-ANNOUNCE list for mirror making sessions.**

Clubhouse Saturday Schedule		
May 4	Steve Clougherty	Jim Gettys
May 11	<b>CLOSED</b> <b>Astronomy Day Outreach</b>	
May 18	<b>WORK PARTY # 5 **</b> Eric Johansson	
May 25	Art Swedlow	Eileen Myers
June 1	Tom McDonagh	John Stodieck
June 8	Eileen Myers	Dave Prowten
June 15	<b>WORK PARTY # 6 **</b> Chris Elledge	
June 22	Phil Rounseville	Joe Wolfe
June 29	Paul Cicchetti	John Reed

**\*\* Closing time for the Clubhouse is determined by the work crew**

Clubhouse Evening Schedule	
Friday Night Educational Videos	<b>ATMoB-Announce</b>
Saturday Afternoon Mirror Making	<b>ATMoB-Announce</b>
Saturday Night Observing	7:00 pm - ##
# Closing time is determined by the organizers	
## Closing time is determined by the "A" members on duty.	

~ *Clubhouse Committee Chairs* ~  
~ *Steve Clougherty, John Reed and Dave Prowten* ~

## Loaner Scope . . .

This Orion Skyquest 4.5-inch, f/8 Dobsonian is available for loan to any club member. Please contact a Clubhouse Committee member or visit the Clubhouse on Saturday evenings for details.



Orion Skyquest 4.5-inch, 900mm, f/8 Dobsonian. \*

The ATMoB Clubhouse and Observing Committees allow members to borrow designated telescopes to be used away from the Clubhouse grounds. The typical sign out period is two weeks but can be extended if approval is given. Instructional tutorials on how to use the telescope can be given before it is signed out. Please see the Clubhouse Committee member on duty at the Clubhouse to borrow a scope.

~ *Al Takeda - Member at Large and Newsletter Editor* ~

## Astronomy Day Event. . .

New England Sci-Tech plans to host a public Astronomy Day event on Saturday, May 11, at 16 Tech Circle, Natick, MA.

See our Astro Day web page <https://www.nescitech.org/astronomy-day/> for details. Plans include indoor astronomy activities and planetarium shows as well as outside telescopes.

Anyone wishing to participate in the planning stages should contact Bob Phinney (508-720-4179) or Rusty Moore at [info@nescitech.org](mailto:info@nescitech.org). See

~ *Submitted by Bob Phinney* ~

# Observing Challenge . . .

April 2019

NGC 4036 – Lenticular Galaxy in Ursa Major  
Mag: 10.7 Size: 3.8' X 1.0'



NGC 4036. Image by Mario Motta M.D

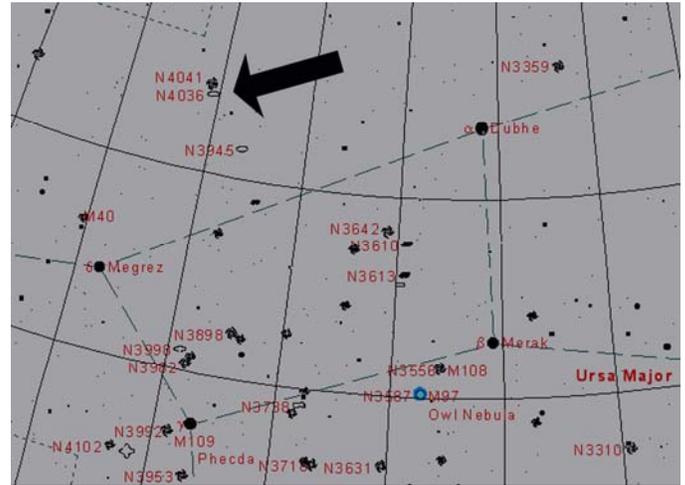
For the third month in a row, the Observer's Challenge brings us face-to-face with a pair of galaxies – this time, in Ursa Major. Our main quest is the lenticular galaxy NGC 4036 (we'll look at its field-of-view neighbor, NGC 4041 later). NGC 4036 was discovered by William Herschel in 1790 and in early star atlases bears the Herschel Catalog designation H I-253 – his 253rd Class I (Bright Nebulae) object. A potential catch in a 4-inch scope (dark skies a must!), NGC 4036 normally requires apertures 2 or 3 times greater, especially when viewed from average suburban skies. Look for a misty oval patch about a half degree NE of a row of three 6th and 7th magnitude stars.

NGC 4041 shares the same medium-power field with NGC 4036, ¼ degree to its NNE. Also discovered in 1790 by Herschel (Herschel Catalog number H I-252), it's a magnitude 11.3 face-on spiral with 2.6' X 2.6' dimensions and is the more challenging of the two.



NGC 4036 (below center) and NGC 4041 (center, near top). Image by Doug Paul

Both galaxies appear to be gravitationally connected and lie about 70 million light years away. Gaze at this distant pair, and the photons entering your eye left when dinosaurs still roamed the earth.



Finder chart from <http://www.hawastsoc.org/deepsky/maps/uma/uma2.gif>

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester ([rogerivester@me.com](mailto:rogerivester@me.com)). To access past reports, log on to <https://rogerivester.com/category/observers-challenge-reports-complete/>

~ Glenn Chaple ~



Observing with the 16-inch Meade Schmidt-Cassegrain in the Ed Knight Obs. \*

## Outreach Report . . .

On Saturday, April 13th, members of the ATMob were at the Farrington Nature Linc in Lincoln, MA to support their evening of astronomy. Unfortunately, the skies did not fully cooperate with the event. Thick, hazy clouds obscured most of the sky for much of the evening, but towards the end, some of the attendees got to observe the Moon. I was joined by Pierre Fleurant, Corey Mooney, John Reed, and Bob Toop. We have helped out at Farrington in the past and the nature center is already planning their next event: A Night of Perseid Meteors.

It's getting late in the season but, despite the lateness of sunset, we've been asked to support three events during May:

- Thursday, May 2: Open House at MIT Haystack Observatory, Westford, MA
- Friday, May 3: Stratton Elementary School's Science Night, Arlington, MA
- Saturday, May 11: Astronomy Day at New England SCI-Tech, Natick, MA (see article)

### **Astronomy Day, Saturday, May 11**

ATMoB member Bob Phinney has asked us to join him at his New England Sci-Tech location to celebrate this year's Spring Astronomy Day. Set up time will be at 2:00 p.m. and the public is invited from 4:00 p.m. until 10:00 p.m. The event will run rain or shine. Bob is hoping that some of us will bring our solar scopes for the afternoon, and telescopes for the evening. An inside space is available for an ATMoB display. Bob has a number of Orion Starblast telescopes. We could set up a scope or two indoors for virtual lunar observing for visitors unable to stay for the evening. Bob also has a Starlab planetarium he will set up for the day. There are other rooms available for demonstrations and/or videos.

It is not possible to know in advance the number of folks attending. He has parking for 120 vehicles with some potential overflow parking at surrounding businesses. As such, Bob is limiting his advertising for this event in order to keep the crowd manageable. Let's have a good turnout from the ATMoB for this event...big or small, Astronomy Day is always fun! It's a great opportunity to introduce the public to telescopes and astronomy, New England Sci-Tech, and the Amateur Telescope Makers of Boston. I'm recommending registration for the event. If you'll be able to attend please register on our event calendar. Also, please email: [info@nescitech.org](mailto:info@nescitech.org) or fill out the "Contact Us" form on the NE Sci-Tech website if you are planning to participate. For more information, check out Bob's event page at <https://www.nescitech.org/astronomy-day/>. See you there!

~ *Rich Nugent - Vice President and Outreach Chair* ~

## **Skyward . . .**

By David Levy, April 2019



Teaching a Vail Astronomy student. Image courtesy of David Levy

During our monthly star nights at our neighborhood Corona Foothills Middle School, I sit down on a chair near the telescope to assist with the observing. The students attending are well behaved no matter their level of interest. Some of the kids are there just for the evening's assignment. But occasionally one student or two will sit down next to me and ask me a few questions. They don't have to do this. They may ask how I got started in astronomy, in a time without computers, or even what my favorite planet or comet is. I love these conversations. They signify to me that the girl or boy is developing an interest in the sky, and an inquiring mind is at work that is so rare and precious these days. That interest and curiosity may go nowhere; it may persist for a few months, or it may go everywhere.

Why are relatively few young people getting into astronomy? Is it because almost no astronomy is taught in schools these days? Too much TV? The internet? Or are astronomy clubs failing to reach the young people of tomorrow?

I would say all of these. Or more to the point, none of these. When I became interested in the night sky at the age of 12, there were even fewer astronomy lectures in school than now. I went into astronomy partly because it offered me a reprieve from the lack of friends I had as a child—I was very shy. And I embraced it because of an increasing innate love of the night sky. I knew nothing, but that's all that was needed.

Now, Wendee and I are offering youngsters a chance to inquire about the night sky. Even if that interest is sparked among only a few, it doesn't really matter. Our attempt might have succeeded with one child. Or five. But it did succeed. The way I see it, we cannot force a child to develop an interest in anything. The spark that sets off a curiosity, even a lifelong curiosity, must come from the child.

I might have developed an acquaintance with astronomy partly because I was searching for an interest that did not involve having to make friends. But my passion for the sky came from the sky itself and its complement of worlds, suns, and galaxies. After many years, I have made lots of friends, most of whom also love astronomy, but in a way it doesn't matter. What began as something to avoid friendship has evolved into one of the friendliest and happiest things I've ever done, a lifelong friendship with the starry host that brightens our nights.

*Editors Note: David Levy has discovered 23 comets and along with collaboration with Eugene and Carolyn Shoemaker he discovered Shoemaker-Levy 9. He also discovered or co-discovered 61 minor planets. He was a contributing editor to Sky and Telescope magazine, Sky News, Astronomy magazine, Science Editor for Parade magazine, and is the author or editor of 34 books. He won an Emmy in 1998 as part of the writing team for the Discovery Channel documentary, Three Minutes to Impact. He currently writes a monthly blog for his local newspaper and astronomy group.*

~ *Submitted by Mario Motta* ~

# ECLIPSE '99 - HUNGARY . . .

By Jean Le Vaux

Two years ahead the plans were laid,  
And long ago the bill was paid,  
But nonetheless  
To our distress  
Marina changed the plans they made.

And so began a lively tale  
With ups and downs along the trail.  
Adventures a-plenty  
For ATMoB gentry,  
But happily, we found the Grail.

The sun shone bright in Budapest  
For 3 full days, from east to west.  
But skies turned dreary;  
We turned weary -  
Tuesday's bus ride quietly stressed.

Our hopes were mixed with secret fear  
That wind and storms would never clear.  
But faith abides;  
Our stalwart guides  
Managed to smile, and persevere.

Wednesday dawned through slits of sky.  
Heartened, we lost the urge to cry.  
No more concerns,  
The sun returns.  
This bus ride's great; our spirits high.

The site was cordoned off for us,  
But Mike and Shilo made a fuss,  
No panorama?  
Where's the drama?  
A roof, at least, would be a plus.

The tension mounts. It's 10 o'clock.  
First contact's soon; there's frenzied talk.  
Would every 'scope  
Be geared to cope?  
Would cameras click? Would clouds unblock?

For hours Howard organized.  
They laughed, but his results were prized.  
They formed a queue  
To better view  
The prominences, undisguised.

Then suddenly, totality!  
Screeches and gasps and shouts of glee.  
There's Bailey's beads!  
Corona's bleeds!  
Two diamond rings shone brilliantly.

The final crescent slivered by  
And 'filters off!' We heard the cry;

Most stared - eyes free,  
Some feared to see.  
But wondrous. Universal high.

Of course it would have still been great  
Had life ordained a different fate.  
If we had missed  
The full eclipse  
Jill's work we'd still appreciate.

In Hungary we had a blast,  
With images enough to last.  
Those thermal jaunts!  
Those special haunts!  
And friends, to share eclipses past.

Szentendre, Hevis, Esztergom,  
The food! The sights! (The money's gone).  
The Danube rides,  
The super guides,  
And best, perhaps, Lake Balaton.

Well Bernie, Mario - you seem  
To operate as quite the team.  
Zimbabwe next?  
You surely jest.  
Once more you weave a cosmic dream.



Sun corona, Lake Balaton, Hungary, August 11, 1999. Pastorius (Wikipedia)

*Editors Note: This poem was written after Jean and Howard Le Vaux returned from viewing the 1999 Total Solar Eclipse at Lake Balaton, Hungary.*

*~ Submitted by Jean Le Vaux ~*

*Editor: \* Photos by Al Takeda unless otherwise noted.*

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**June Star Fields DEADLINE  
Sunday, May 26<sup>th</sup>**

**Email articles to Al Takeda at  
[newsletter@atmob.org](mailto:newsletter@atmob.org)**

**Articles from members are always welcome.**

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**POSTMASTER NOTE: First Class Postage Mailed April 28, 2019**

Amateur Telescope Makers of Boston, Inc.  
c/o Chris Elledge, Membership Secretary  
99 College Ave  
Arlington, MA 02474  
**FIRST CLASS**

**EXECUTIVE BOARD 2018-2019**

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NEWSLETTER	Al Takeda	<a href="mailto:newsletter@atmob.org">newsletter@atmob.org</a>
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<b>PUBLIC OUTREACH</b>		
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STAR PARTIES:	Bernie Kosicki	
	Laura Sailor	
	John Harrington	

## How to Find Us...

### Web Page [www.atmob.org](http://www.atmob.org)

**MEETINGS:** Held the second Thursday of each month (September to July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION see [www.atmob.org](http://www.atmob.org) and check your email on the ATMOB-ANNOUNCE list.

**CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W**

The Tom Britton Clubhouse is open every Saturday from 7 p.m. to late evening. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather. It is wise to call in advance: (978) 692-8708.

## Heads Up For The Month . . .

**To calculate Eastern Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.**

May 4 New Moon  
May 5 Eta Aquariid Meteors peak (13 UT - 9 EDT)  
May 10 Lunar Occultation of M44 (02 to 04 UT - 22 to 00 EDT)  
May 11 First Quarter Moon (Moonset at midnight)  
May 18 Full Moon, Venus 1.8 degrees South of Uranus  
May 20 Jupiter 1.7 degrees South of Moon  
May 22 Saturn 0.5 degrees North of the Moon  
May 26 Last Quarter Moon (Moonrise at midnight)  
Jun 3 New Moon