



Roanoke Valley Astronomical Society

Amateur Astronomy News and Views
In Southwestern Virginia



Volume 41—Number 11

November 2024

RVAS October Meeting Notes

Fixing Newton's First

By Erin Elliott, Secretary

A quick reminder about the new method for the meeting minutes and Zoom recordings: You can view this month's Zoom recording by [clicking this link](#). The passcode to view the video is: **eP3Q=A0&**. You can find a timestamp for each segment of the meeting next to the corresponding section header. For example, **What's Up? | 0:57:00**. Also for your convenience, you can find a full list of the segments and timestamps below:

- **Program #1 | 0:03:10**
- **What's Up? | 0:57:00**
- **Review of Astronaut Tom Jones lecture at Roanoke College | 1:14:26**
- **RVAS Outreach at Explorer Park | 01:15:16**
- **Visual Observing Reports | 01:17:43**
- **Astrophotography | 01:18:30**

Agenda (7:30)

- 7:00 Celestial Café
- 7:30 Agenda
- 7:31 Visitor / Guest / Member recognition
- 7:34 Leadership Review
- 7:35 Daniel Hoeck, Ph.D:
"Newton's First Law of Motion"
- 8:20 What's Up November (Dr. John Wenskovitch)
- 8:40 Review of Astronaut Tom Jones at Roanoke College
- 8:42 Review of the Friday Oct 18 RVAS Outreach event
- 8:50 Visual Observing reports
- 8:54 Monthly Astro-photos

After wrapping up the Celestial Café, the meeting began at 7:30pm with an introduction from RVAS President, **Michael Good**. He welcomed members and guests to the October meeting before going over the agenda.

Attendance: There were 39 members and 1 guest in attendance. 17 individuals were in person and 23 attended virtually.

Program | 0:03:10: Daniel Hoek received his master's degree from the University of Oxford and Ph.D. from New York University. His professional career includes research and lecturing at Princeton University and Visiting Positions at the University of Amsterdam and at École Normale Supérieure and at Institut Jean Nicod in Paris. Dr. Hoek is currently the Assistant Professor of Philosophy at Virginia Tech. His presentation on the misinterpretation of Newton's first law of motion was both stimulating and informative.

October Meeting Agenda – Michael Good Slide



Fixing Newton's First – Dr. Hoek Slide

Mistranslation of Newton's First Law Discovered after Nearly 300 Years

- Scientific American article that got picked up and spread

Astronomy <3 Philosophy

- Both love big questions
- Many recent works on cosmology

The Story of Eratosthenes

- Philosopher and librarian
- Alexandria, 240 BC
- How big is the earth?
- Knew the shape was a sphere from Aristotle
- Story of the well in Syene on the summer solstice

Newton's First Law (Standard Version)

- "When a body is free from impressed forces, it continues in its state of rest or uniform motion in a straight line"

Why this is a weird law?

- Reason 1: Why have a separate law of nature... (see slide)
- Reason 2: Why have a law that doesn't apply to anything?
 - o There are no objects that are really free of impressed forces!
- Reason 3: Why have a separate First Law, when it is already implied by the Second Law?
 - o The Second Law says $F = m \cdot a$. So to see what happens when no forces are acting, just put $F = 0$

Let's take another look at what Newton actually wrote:

- Originally in Latin
- Translated: *Every body perseveres in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by the forces impressed.*
- Rephrased: *Every body only **diverges** from uniform linear motion **to the extent** that forces compel it to diverge.*
- Correct Paraphrase: *Every change in a body's state of motion is due to impressed forces (forced changes only)*

Why have a separate law of nature for objects on which no forces are acting?

- Answer: Actually, the First Law governs both force-free bodies *and* bodies subject to forces

Why have a law that doesn't apply to anything?

- Actually, the First Law applies to all bodies in the universe
- Take Newton's example: a spinning top keeps spinning, except insofar as friction forces slow it down

Historical aside...

- Prior to Newton physicists and philosophers had posited all sorts of alternative ways in which objects could change speed or direction without external forces

Why have a separate First Law, when it is already implied by the Second Law?

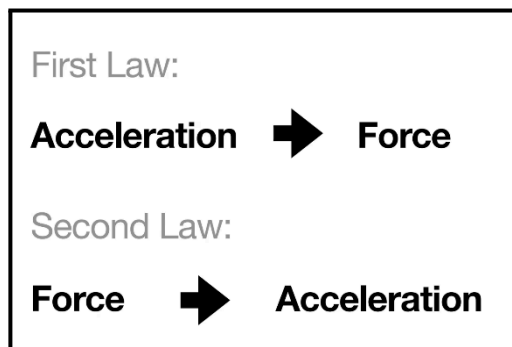
- Answer: The Second Law doesn't entail the First, because it fails to rule out unforced changes in motion

Why did nobody notice this??

- 1729-1999 Translation by Andrew Motte
- Every body perseveres in its state of being at rest or of moving uniformly straight forward, **unless** it is compelled to change its state by the forces impressed

What about $\Sigma F = m \cdot a$?

- This principle entails both of Newton's First and Second Law
- It's a combination of the two



First & Second Laws – Dr. Hoek Slide

Let's Fix Newton's First Law

- A modern and mathematically elegant approach is to combine Newton's First and Second Laws of motion into the principle $\Sigma \mathbf{F} = m \cdot \mathbf{a}$
- A traditional and pedagogically useful approach is to separate out the two laws. But if you do that, use the correct formulation and interpretation of the First Law
- Under the influence of the traditional misreading of the First Law, the law has been cast as a lot of different things
- Instead, just teach the First Law for what it really is: a principle about where changes in motion come from (and use the right translation)

What's Up? | 0:20:22: Before turning to our program for the evening, Michael asked **John Wenskovitch** for his "What's Up?" program on what the skies of September have in store for us. John's "What's Up? Highlights" in this issue provide a summary of the program. You can watch a recording of his program by clicking the link at the beginning of the newsletter.

John also highlighted the following Astronomical League Program for members to check out: [Hydrogen Alpha Solar Observing Program](#).

Review of Astronaut Tom Jones Leadership Speaker lecture at Roanoke College | 1:14:26

RVAS September 2024

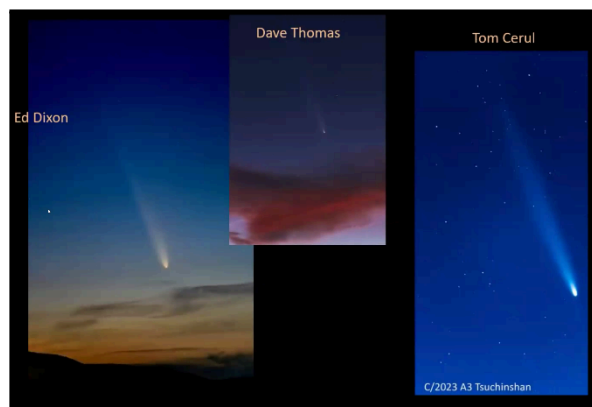
We received an invitation to attend the Leadership Speaker Series at Roanoke College with guest speaker Astronaut Tom Jones. RVAS members **Saniya Tumbde**, **Michael Good**, **Bill Krause** and **Bill Savage** attended the event.

RVAS Outreach at Explorer Park | 01:15:16

On Friday, October 18, RVAS hosted an outreach event at Explorer Park. The highlights of the night were spotting Tsuchinshan, Starlink, and rings of Saturn. It was a great turn out from the community.

Member Observation Reports | 01:17:43: John Goss

observed the Tsuchinshan-ATLAS comet. Even though the skies on the east coast were clearer for most RVAS members, **John Wenskovitch** still managed to see it with binoculars in Washington State.



Zoom Screenshot – Ed Dixon, Dave Thomas, Tom Cerul photos

Astrophotography | 01:18:30: We thank **Tom Cerul**, **Ed Dixon**, **Michael Good**, **Ben Hartman**, **Bert Herald** and **Dave Thomas** for providing their work this month. We had a variety of images focusing on near and deep sky objects.

To provide each image with the focus it deserves, we are sharing the submissions in a separate article in this newsletter. Do not miss checking out the rest of these images.

You can also visit our [RVAS Facebook Group](#) to see where photos are posted during the month.

Next month: On Monday, November 18 at 7:30pm, we will meet and listen to a presentation from Dr. James A. Gerald from Hollins college on *What is a Neutron Star?* Please note that our meeting location is still in the STEM Building, but upstairs in room ST212.

The meeting was adjourned at 8:55pm.

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of observational and photographic astronomical activities. **Meetings are held at 7:30 p.m. on the third Monday of each month. See calendar on last page of newsletter for location. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. For information regarding joining RVAS, including annual dues, [click here](#). Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

Officers/Executive Committee/Editor/Webmaster

Michael Good, President (president@rvasclub.org)

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Erin Elliott, Secretary (secretary@rvasclub.org)

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Nancy Vogelaar, Officer at Large #1 (officeratlarge1@rvasclub.org)

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Ed Dixon, Newsletter Editor (editor@rvasclub.org)

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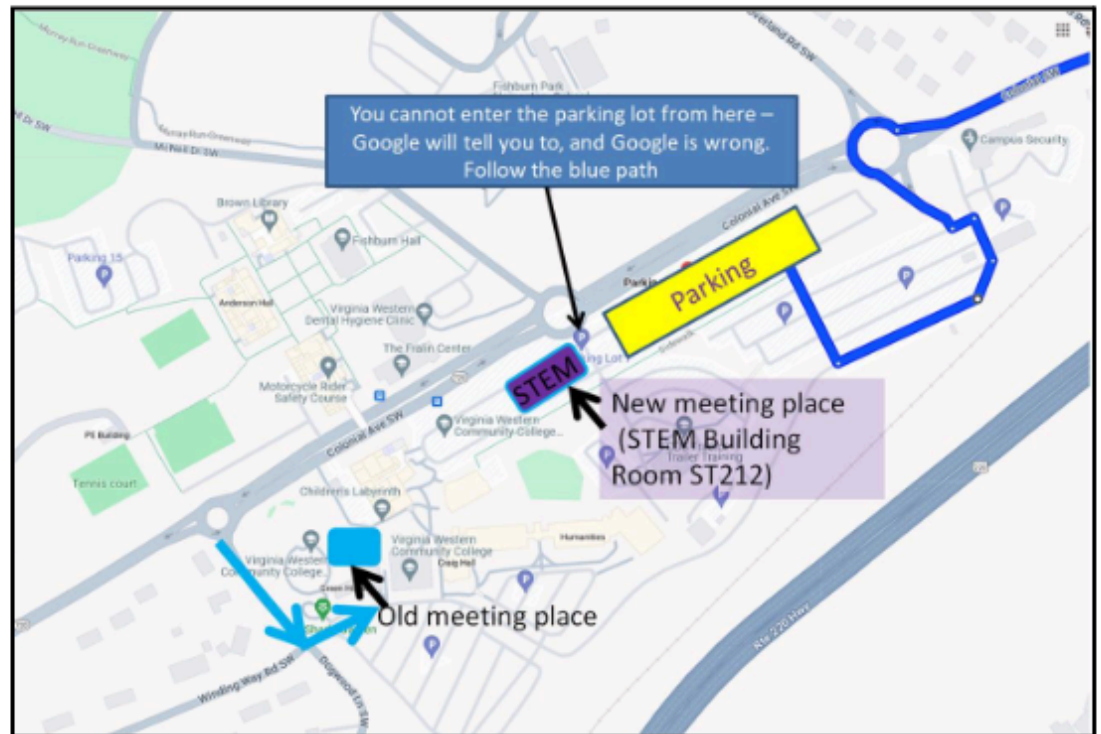
RVAS Member Anniversaries

Member anniversaries is taking a temporary hiatus and will resume in a future newsletter.

Directions to RVAS Meeting Location

Virginia Western Community College STEM Building, Room ST212
3094 Colonial Ave SW, Roanoke, VA 24015

VWCC is located in the southwestern area of the City of Roanoke. The STEM Building is accessed via the roundabout at Overland Drive and Colonial Avenue, near Campus Security at the top right of the map. The STEM Building is at the opposite end of the Colonial Avenue parking lot from Campus Security. Follow the darker blue path from the roundabout and park anywhere in the lot.



Note: Google provides incorrect guidance to access the parking lot from the roundabout at McNeill Drive. That roundabout **does not** provide an entrance to the parking lot.

Roanoke Valley Astronomical Society

Monday, November 18, 2024, 7:30 PM

“What is a Neutron Star?”

Presented by

James A. Gerald, PhD
Hollins University



Received a PhD in Electrical Engineering from Syracuse University in '93 and a second PhD in Physics from Johns Hopkins University in '95 based on tau-lepton research at CERN from '92 to '95. Academic appointments include a Postdoc in nuclear physics at Brookhaven National Labs, a year at Christopher Newport University teaching physics and electrical engineering, and recently ten years at Delta State University in a variety of teaching and administrative posts. Nonacademic work includes 10 years working with the Air Force Medical Service on deployed medical records and surveillance as well as 6 years as a consultant to pharmaceutical and health insurance firms. Currently service as the Associate Provost for Graduate Programs at Hollins University.

What's Up? Highlights

November 1 to 30, 2024

This Month:

November skies are dominated by the outer planets and a swarm of meteor showers. While Mercury and Venus are present in the evening twilight, they are mostly gone by 8pm. In contrast, the middle of the month features Saturn, Uranus, and Neptune above the horizon at sunset, with Jupiter following shortly after at 6:36pm, and Mars joining the show at 9:50pm. By the end of the month, Jupiter is rising at 5:29pm as the King of the Planets approaches its opposition. The Taurid and Leonid meteor showers are the heavy-hitters this month, with the Southern Taurids peaking on the 5th, the Northern Taurids on the 12th, and the Leonids on the 17th. Roanoke just misses an occultation of Saturn by the Moon on the 10th, but we do get to experience an occultation of Neptune on the 11th. Uranus reaches opposition on the 16th, but is visible throughout the entire night for several before and after. The end of the month features yet another lunar occultation of Spica on the 27th. And hopefully we'll get another aurora outburst or two!

Celestial Events:

- November 5: Peak of the Taurid meteor shower
- November 10: Saturn just above the Moon
- November 11: Lunar occultation of Neptune
- November 15: Final "Supermoon" of the year
- November 17: Peak of the Leonid meteor shower
- November 20: Grouping of the Moon, Mars, and M44 (the Beehive Cluster)
- November 27: Lunar occultation of Spica

Sunset and Twilight:







- Sunset ranges from 6:20pm (1st) to 5:02pm (31st)
- Evening twilight ends from 7:48pm (1st) to 6:34pm (31st)

Lunar Phases and Apsides:

- New Moon: November 1, 8:48am
- First Quarter: November 9, 12:56am
- Perigee: November 14, 6:14am (223,762 miles)
- Full Moon: November 15, 4:29pm
- Last Quarter: November 22, 8:29pm
- Apogee: November 26, 6:55am (251,850 miles)

October 2024

Ctrl- Click on the picture see the source file and additional information

<p>Michael Good</p> 	<p>Michael Good</p> 
<p>Michael Good</p> 	<p>Michael Good</p> 
<p>David Thomas</p> 	<p>David Thomas</p> 

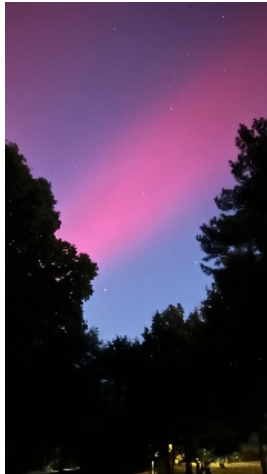
Tom Cerul



Tom Cerul



Michael Good



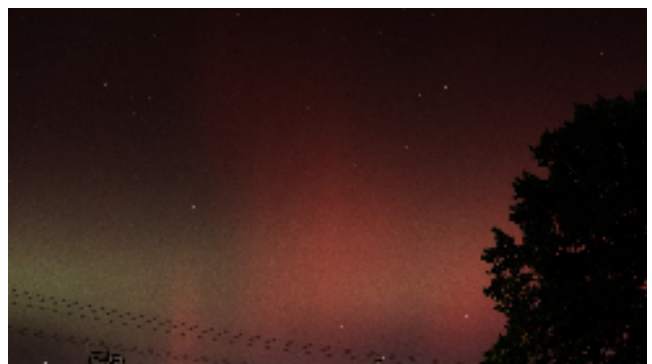
Bert Harold



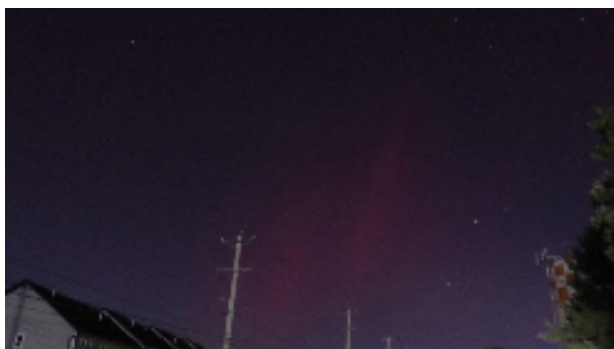
David Thomas



David Thomas



David Thomas



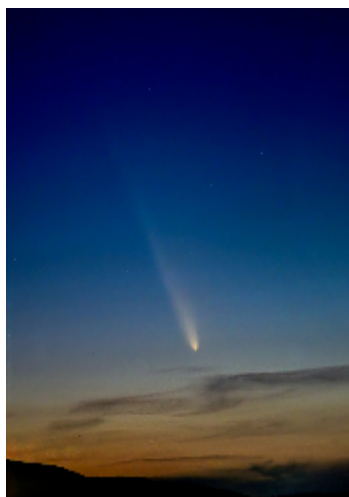
David Thomas



Ben Hartman



Ed Dixon



David Thomas



Tom Cerul



David Thomas



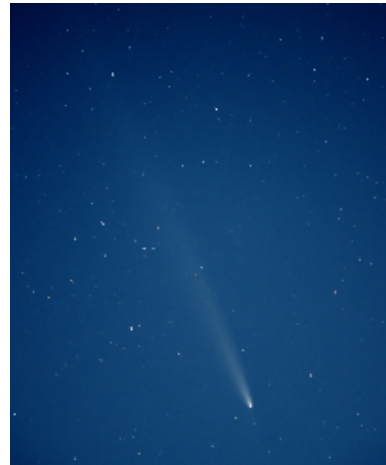
Michael Good



Tom Cerul



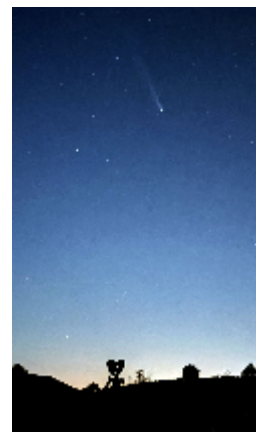
Ed Dixon



Ed Dixon



Roger Pommerenke



Tom Cerul



Vincent ST. Angelo



Vincent ST. Angelo



Ed Dixon



Ed Dixon



Ed Dixon



Ben Hartman



David Thomas



Michael Good



Michael Good



Roger Whitley



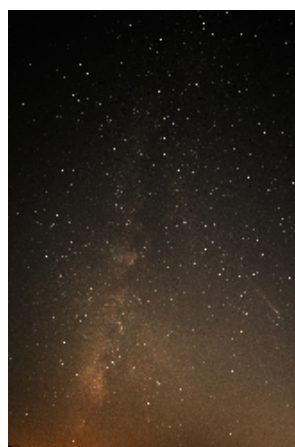
Ben Hartman



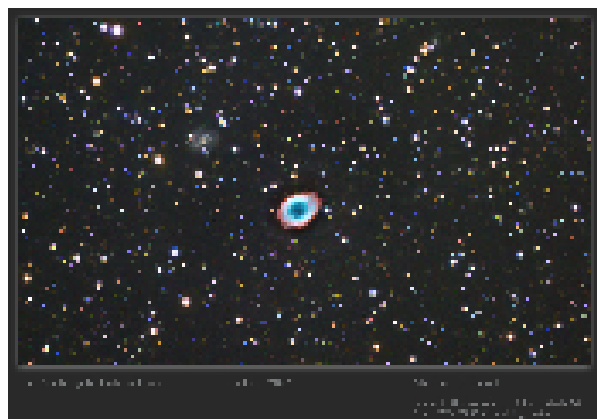
Ben Hartman



David Thomas



Michael Good



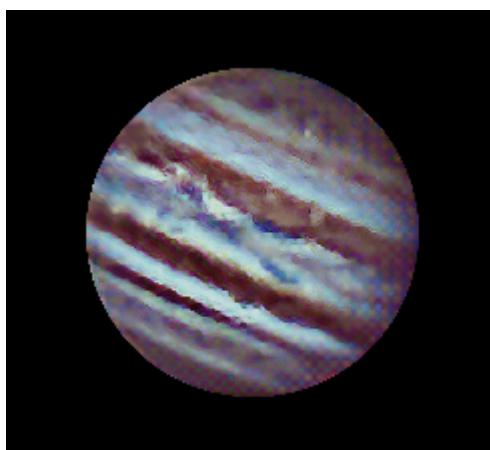
Michael Good



Tom Cerul



Ed Dixon



Ben Hartman



Ed Dixon



Ed Dixon

