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## In This Issue

### Page One

Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

President's Article

Inside Stuff

4 Treasurers Report

4 Meeting Agenda

5 Astro-Imaging SIG

5 FAAC Equipment List

7 FAAC Meeting Minutes - July 24, 2014

## Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at  $9.8 \text{ m/s}^2$  ( $32 \text{ ft/s}^2$ ). Only, that's not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

But surprisingly, the amount of water content stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers.

*(continued on Page 3)*

## President's Article

By Tim Campbell

### Equipment Update & Modeling Clouds

Bob MacFarland, Doug Bauer, and George Korody have sorted through all the equipment donated to the club by our generous donor, Maria Cominou. Incidentally, George received another phone call from Maria... she found a few more items. Mostly, these are accessories related to the equipment she has already donated.

I'm waiting to hear from Bob, Doug, and George that everything is ready to go, but I thought I'd share an update on what they've done to this point.

The equipment has been sorted into categories and also grouped into "kits". A considerable amount of gear was donated, but apart from a few exceptions, nothing was really associated with anything else.

*(continued on Page 2)*

# STAR STUFF

## August 2014 - Vol. 24 No 8

STAR STUFF is published eleven times each year by:

**FORD AMATEUR ASTRONOMY CLUB**  
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Dearborn MI 48121-7527

PRESIDENT: Tim Campbell  
VICE PRESIDENT: Art Parent  
SECRETARY: Ellen Duncan  
TREASURER: Gordon Hansen  
WEBMASTER: Greg Ozimek  
NEWSLETTER EDITOR: Jennifer Monske

### Club Information:

The Ford Amateur Astronomy Club (FAAC) meets on the fourth Thursday each month, except for the combined November/December meeting on the first Thursday of December - at Henry Ford Community College Administration Services and Conference Center in Dearborn. Refer to our website for a map and directions ([www.fordastronomyclub.com](http://www.fordastronomyclub.com)).

The FAAC observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains an after-hours permit, and observes on Friday and Saturday nights, and nights before holidays, weather permitting. The FAAC also has use a private observing site near Gregory Michigan and lake Erie Metro Park. See the FAAC Yahoo Group\* for more information.

Observing schedules and additional info are available on our website, or via the FAAC Yahoo Group.\* Or call the FAAC Hotline, for info and leave a message, or ask questions: 313-757-2582. or send email inquiries to [info@fordastronomyclub.com](mailto:info@fordastronomyclub.com).

Membership in the FAAC is open to anyone with an interest in amateur astronomy. The FAAC is an affiliate of the Ford Employees Recreation Association (F.E.R.A.). Membership fees:

Annual - New Members: \$30 (\$15 after July 1)  
Annual - Renewal: \$25 (\$30 after January 31)

Membership includes the STAR STUFF newsletter, discounts on magazines, discounts at selected area equipment retailers, and after-hours access to the Island Lake observing site.

### Astronomy or Sky & Telescope Magazine Discounts

Obtain the required form from the FAAC club treasurer for a \$10 discount. Send the completed form directly to the respective publisher with your subscriptions request and payment. Do not send any money directly to the FAAC for this.

### Star Stuff Newsletter Submissions

Your submissions to STAR STUFF are welcome! Send your story and/or images to the editor: [StarStuff@fordastronomyclub.com](mailto:StarStuff@fordastronomyclub.com) Email text or MS Word is fine. STAR STUFF will usually go to press the weekend prior to each general meeting. Submissions received prior to the 15th can be included in that issue.

\* FAAC Members are welcome to join our Ford Astronomy Club

*This months background photos of the moon Page 1 courtesy of John Kirchoff. See more of John's photos at:*

<http://www.flickr.com/photos/33926475@N06/with/4311533997/>

Bob, Doug, and George thought it would make sense, for example, to sort through the eyepieces that were donated and determine which eyepieces were best used with each telescope. This way, when someone wants to use a telescope, there are a few eyepieces with it which would be useful given the focal length and focal ratio of the telescope. Also, there were some mounts donated... some of which are electronic "go to" type mounts. They've determined which equipment would work best with these mounts.

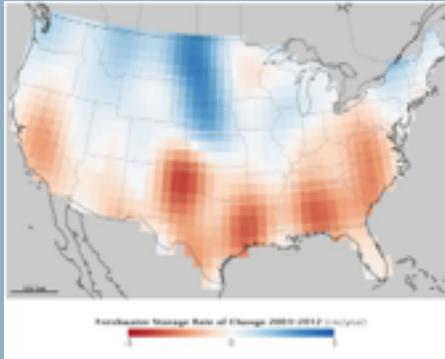
In addition to grouping things into "kits", they've also assigned a skill level to the kit to indicate if it's gear you can "just use" vs. gear you'd need to do a bit of reading or learning before using.

Some of the equipment is in miscellaneous boxes or other packaging and to avoid having loose pieces, we are considering ways to package the "kits" to a minimum number of containers to avoid equipment being lost or misplaced. Also, it would be nice to get everything labeled (also to avoid things being mislaid.) This is to say, I don't think the equipment is quite ready ... but it is close. George and various others (Tim Dey, myself, etc.) have been trying to test each "electronic" item to make sure they actually work. We have discovered a few issues along the way, but so far we've been able to remedy each issue (for the equipment we have tested to date.)

Not all of the equipment is directly useful, so there is some gear which they recommend selling or donating. A few items are either miscellaneous items that aren't directly tied to any other piece of gear and in some cases are not even directly related to astronomy.

George did make what I think is an excellent suggestion: As there is a great deal of new equipment, he thought it would be appropriate to request that those first people who would like to check out the gear would also prepare a "Tech Talk" about the gear to share with the club.

(continued on Page 6)



*Image credit: NASA Earth Observatory image by Jesse Allen, using GRACE data provide courtesy of Jay Famigleitti, University of California Irvine and Matthew Rodell, NASA Goddard Space Flight Center. Caption by Holli Riebeek.*

## Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

*(continued from Page 1)*

Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time. Groundwater supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River

Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "[W]ithout GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can't do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, not sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand!

Learn more about NASA's GRACE mission here: [http://www.nasa.gov/mission\\_pages/Grace/](http://www.nasa.gov/mission_pages/Grace/)

Kids can learn all about launching objects into Earth's orbit by shooting a (digital) cannonball on NASA's Space Place website. Check it out at: <http://spaceplace.nasa.gov/how-orbits-work/>

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

## Treasurer's Report

### August 16, 2014

By Gordon Hansen

Aug 16, 14

#### ASSETS

##### Current Assets

##### Checking/Savings

10000 · Checking	586.98
11000 · FAAC Savings	
11100 · FAAC Club Savings	857.03
11200 · Equipment	1,327.36
11300 · Scholarship	622.76
11400 · GLAAC	4,801.21
<b>Total 11000 · FAAC Savings</b>	<b>7,608.36</b>

12000 · Petty Cash Account	104.50
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##### 13000 · CD's

13100 · CD 200599272	1,060.03
13200 · CD 205196033	1,004.82
13300 · CD 89265268	1,107.65

<b>Total 13000 · CD's</b>	<b>3,172.50</b>
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<b>Total Checking/Savings</b>	<b>11,472.34</b>
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<b>Total Current Assets</b>	<b>11,472.34</b>
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<b>TOTAL ASSETS</b>	<b>11,472.34</b>
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## Meeting Agenda - August 28th

HFCC – Berry Auditorium -Admin. Services & Conference Center [www.fordastronomyclub.com](http://www.fordastronomyclub.com)  
5:30

### Opening/Introduction/Member Observing

#### Main Presentation:

Astrophotography Elements      Chris Strang

### Club Projects/Committees/Member Support

### Club Business/Secretary/Treasurer/Equipment Reports

## Club Wear

You can order online from LL Bean, using the instructions contained in a file that you can view on our club Yahoo Group website Club Wear file folder at

<http://tech.groups.yahoo.com/group/FordAstronomyClub/files/Club%20Ware/>

## Classified

Meade LX200GPS – 8 inch SCT with a Scope Buggy dolly.

Asking \$1800

Contact: Joan Onkka, 734-525-0228

Orion SkyQuest XT10 Classic Dobsonian  
Asking \$350

Contact: Gordon Hansen, 734-624-1102  
or on Yahoo

## Astro Imaging SIG

Gordon Hansen

All are invited to join us in the Astro Imaging SIG meetings, to share and discuss images, experiences, and techniques.

We always have a good time, with lively discussion, and sharing of valuable information.

Next meeting is **September 11th**. The meeting room location – HFCC Admin. Services and Conference Center (same building), Berry Amphitheater Auditorium.

Topics invited. Pizza served.

## FAAC Events 2014

**Sept 18-21st – Great Lakes Star Gaze in Gladwin, Michigan**

**Sept 26-27th – 6pm Astronomy at the Beach at Kensington Metropark**

*Background Photo from Lunt Solar Scope Image taken at the Hector J Robinson Observatory, June 28, 2010*

### One FAAC members blog

<http://hjrobservatory.blogspot.com/>

A few updates on the observatory, quick articles and photos. I'll try to improve my writing on this blog. Also, I try to keep daily updates on this blog. - Greg Knekleian, HJRO volunteer.

## FAAC Equipment Report 8/15/14

By Dennis Salliotte

<u>Item</u>	<u>Currently Held By:</u>	<u>Date Last Verified</u>
<b><u>Telescopes</u></b>		
4" Dobsonian	George Korody	1/18/14
4 ½ " Galileo Alt/Az Reflector	James French	7/12/14
8" Orion 8XTi Dobsonian	James French	7/12/14
4" Donated Reflector in need of repair	George Korody	1/18/14
<b><u>Presentation Tools</u></b>		
Projector	Jim Frisbie	6/26/14
Projection Screen 8'	Bob MacFarland	2/13/14
Speaker System w/wireless mic	Bob Mac Farland	2/13/14
Bullhorn	George Korody	1/18/14
DVD Player	Jim Frisbie	1/26/14
Projection Screen 6'	Gordon Hansen	7/13/14
Projector, ViewSonic	Larry Goodsell	7/29/14
<b><u>Demonstration Tools</u></b>		
Weight On Planets Scale	George Korody	1/18/14
Lunar Phase Kit	Bob MacFarland	2/13/14
100 ft Scale Model Solar System Kit	Bob MacFarland	2/13/14
<b><u>Display Items</u></b>		
Astronomy Event Sign (3' X 6')	Gordon Hansen	7/13/14
PVC Display Board - Folding	Tim Campbell	6/5/14
Banner – Large (32" X 16')	Dennis Salliotte	7/13/14
Banner – Medium (24" X 72")	Chuck Jones	8/7/14
Banner – Small (24" X 32")	George Korody	3/15/14
Tri-Fold Presentation Boards	Don Klaser	1/23/14
Tri-Fold Poster Board (Early Club Photos)	George Korody	1/18/14
<b><u>Other</u></b>		
Sky Quality Meter	Jon Blum	8/7/14
Canopy (10' X 10')	Tim Campbell	8/10/14
Equipment Etching Tool	Gordon Hansen	4/22/14
Pop Cooler	Michael Dolsen	6/26/14

# FAAC General Meeting Minutes July 24th, 2014

By Jim Frisbie

## Opening:

The meeting was called to order in the Berry Auditorium at 5:30 pm by Vice President, Art P. All attendees introduced themselves. Guests were welcomed. The Club Mentoring Program was described. Two Club members passed away since our last meeting, John Schroer and Bob FitzGerald. They will be missed. Jon B offered and tribute to John Schroer and Jim Frisbie spoke about his friend Bob FitzGerald. FAAC has lost two bright stars.

## Observing Experiences:

Milt F. and Rick A. spoke about their observing experiences. Dennis S. told us about equipment that has been donated to the Club and how it is being cataloged.

## Main Presentation:

"Southern Hemisphere Skies" was presented by Jon Blum.

## Business Meeting:

- Club Equipment Report - Dennis S. told us about equipment that has been donated to the Club and how it is being cataloged.
- Secretary's Report in Star Stuff - Approved
- Treasurers Report in Star Stuff - Approved

## Projects and Events:

- August 2nd – Annual Multi-Club Picnic and Beginners Night at Island Lake State Park.
- September 18-21 - Great Lakes Star Gaze in Gladwin, MI
- September 26-27 - Astronomy at the Beach, Kensington Metro Park, 6pm to Midnight both nights. Volunteers are encouraged to sign up.

## Announcements:

Astronomy at the Beach volunteers are encouraged to sign up. Contact George Korody.

- The Club is looking for volunteers to represent FAAC at GLAAC.

The meeting was adjourned at 7:40 pm by Vice President Art P.

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## President's Article

*(continued from Page 2)*

### Modeling Clouds

Do you wonder if it will be clear on the evenings when you plan to do some observing? While it's easy to use a weather website to get a "current" satellite image, we're usually more interested in an image of where the cloud are likely to be at some point in the future.

To that end, I've learned to make use of the modeling data available at the wunderground.com weather site using the "Model Data" layer of a feature they call the Wundermap.

To use the feature, you visit wunderground.com/wundermap, turn off all the "layers" available, then switch on the "Model Data" layer and select a weather model which includes "Total Cloud Cover Percent" as a feature of the model and set the date & time to your observing period.

This sounds more confusing than it actually is... but it's probably easier to watch how to do this rather than read about it. To that end, I've made a video. Visit: [tinyurl.com/cloudmodel](http://tinyurl.com/cloudmodel) to watch this video (just under 6 minutes long) which walks through exactly how I do this.

Clear Skies!

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