# THE STAR DIAGONAL

THE JOURNAL OF THE OGDEN ASTRONOMICAL SOCIETY



**OAS Executive Committee**

President - Lee Priest - (801) 479-5803
LeVae@aol.com

Treasurer- Doug Say - (801) 731-7324
dougsay@comcast.net

Vice Pres- Ron Vanderhule - (801) 726-8554
deepsky100@msn.com

Past Pres- Craig Browne - (801) 388-6556
cbrowne@Readytek.net

Secretary- David Dunn - (801) 544-7705
dunndave@aol.com

ALCOR- Dustin Klein - (801) 309-5471
red8968@msn.com



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## Connect with Us

Web: http://ogdenastronomy.com/ Private Email Group: OAS_News@yahoogroups.com

Email: OgdenOAS@gmail.com Twitter: @OgdenOAS Facebook: Ogden Astronomical Society

## President's Message

I hope everyone has been able to stay cool these last few weeks. If you are looking for a great way to beat the heat come on up to Monte Cristo for our star party and camp out July 17th and 18th. If you can't make it to the July star party we will be doing it again August 14th and 15th. The details are included in this newsletter; I hope we see you there.

For the past several years we have counted the July and August Monte Cristo star parties as our July and August Meetings. The next formal club meeting will be September 10th at 7:30 at the Ott Planetarium. The main topic will be club business and annual elections, I think all the current club officers have agreed to a nomination for a second year but we would like to encourage anyone interested to accept a nomination for one of the positions. The more people we can get involved the better for all of us. Positions open are President, Vice President, Secretary, and Treasurer.

Another don't miss event in August is the Perseid Meteor shower that peaks on the 11th. Just come up to Monte Cristo a few days early, several of us will be there.

Thanks,
Lee Priest

## Star Parties

Public

- 8/8 – Antelope Island
- 9/10–9/13 – Great Basin Astronomy Festival
- 9/19 – Antelope Island
- 10/17 – Antelope Island

Requested

Private

- 7/17-7/19 – Monte Cristo (many arrive by Weds or Thurs)
- 8/14-8/16 – Monte Cristo
- 10/9-10/11 – Messier Marathon (Curlew)

## Monte Cristo Star Party and Family Camp Out

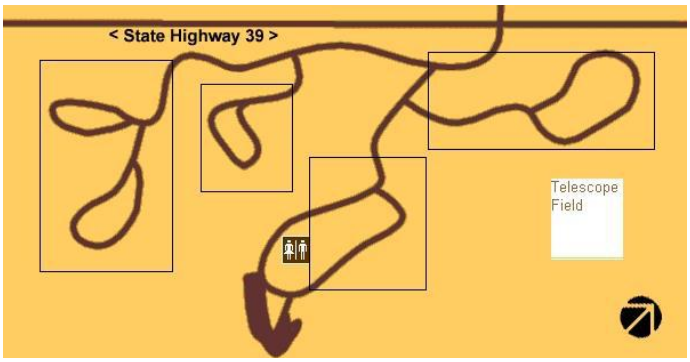
With summer heating up it's time to start thinking about our premier activity of the year, the family camp out and star party at Monte Cristo. For those not familiar with this activity it will be held Friday and Saturday July 17th and 18th and August 14th and 15th at the Monte Cristo campground. We have several people go earlier in the week and some who just come up for the evening and don't camp, whatever will fit your interest and schedule.

To get there from Ogden, go East on Highway 39 about 40 miles up Ogden Canyon to the top of the mountain, you will be about 9000 ft. elevation when you get there. We try to get in loop E, to get there just keep turning left after you enter the campground. Monte Cristo is a National Forest campground, they don't take reservations. They have paved roads with tables and fire pits at each camp site, a restroom with flush toilets and a few water taps located around the loop. Last year the fee was $18.00 per night.

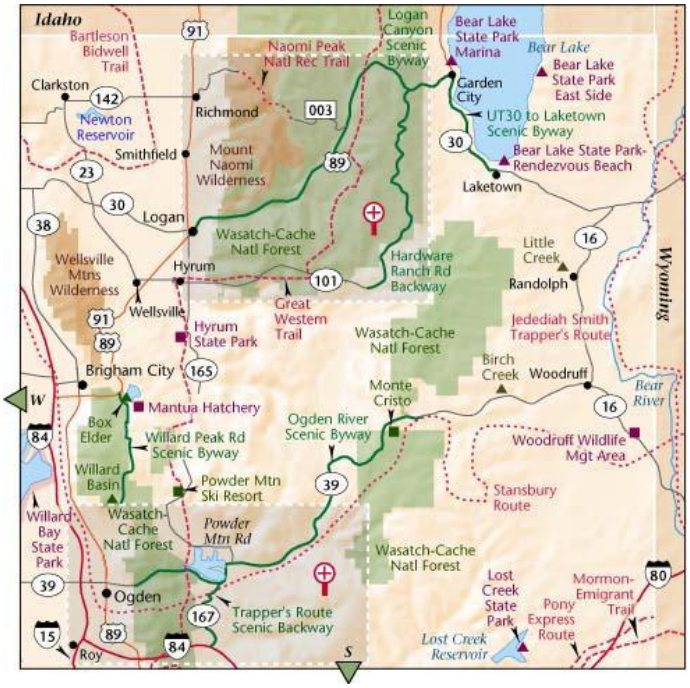
We set up telescopes in a field northeast of the campground and have permission from the Forest Service to drive out there. Day time activities include Tea parties in late morning on Friday and Saturday location to be determined. These are informal gatherings bring your own beverage, if you have a snack to share bring it, we always have plenty so come and enjoy. We also have pot luck dinners Friday and Saturday evening at 6:00; bring your own something to BBQ and a dish to share. We have a few BBQ grills set up for everyone to use, if you have a portable grill we could use them.

If you have any questions contact anyone on the Executive Committee.

Lee Priest




Map of Monte Cristo campground. There are more restrooms than noted. You want to try to get in the small loop by the Telescope field. The other loop near the field is also close.




### No Surprise! Earth's Strongest Gravity Lies Atop The Highest Mountains

By Ethan Siegel

Put more mass beneath your feet and feel the downward acceleration due to gravity increase. Newton's law of universal gravitation may have been superseded by Einstein's, but it still describes the gravitational force and acceleration here on Earth to remarkable precision. The acceleration you experience is directly proportional to the amount of mass you "see," but inversely proportional to the distance from you to that mass squared.

The denser the mass beneath your feet, the stronger the gravitational force, and when you are closer to such a mass, the force is even greater. At higher elevations or even higher altitudes, you'd expect your gravitational force to drop as you move farther from Earth's center. You'd probably also expect that downward acceleration

to be greater if you stood atop a large mountain than if you flew tens of thousands of feet above a flat ocean, with nothing but ultra-light air and liquid water beneath you for all those miles. In fact this is true, but not just due to the mountain's extra mass!

Earth is built like a layer-cake, with the less dense atmosphere, ocean, and crust floating atop the denser mantle, which in turn floats atop the outer and inner cores of our planet. An iceberg's buoyancy is enough to lift only about one tenth of it above the sea, with the other nine tenths below the surface. Similarly, each and every mountain range has a corresponding "invisible mountain" that dips deep into the mantle. Beneath the ocean floor, Earth's crust might be only three to six miles thick, but it can exceed 40 miles in thickness around major mountain ranges like the Himalayas and the Andes. It's where one of Earth's tectonic plates subducts beneath another that we see the largest gravitational anomalies: another confirmation of the theory of continental drift.

A combination of instruments aboard NASA's Gravity Recovery and Climate Experiment (GRACE) satellites, including the SuperSTAR accelerometer, the K-band ranging system and the onboard GPS receiver, have enabled the construction of the most accurate map of Earth's gravitational field ever: to accelerations of nanometers per second squared. While the mountaintops may be farther from Earth's center than any other point, the extra mass of the mountains and their roots – minus the mass of the displaced mantle – accounts for the true gravitational accelerations we actually see. It's only by the grace of these satellites that we can measure this to such accuracy and confirm what was first conjectured in the 1800s: that the full layer-cake structure of Earth must be accounted for to explain the gravity we experience on our world!

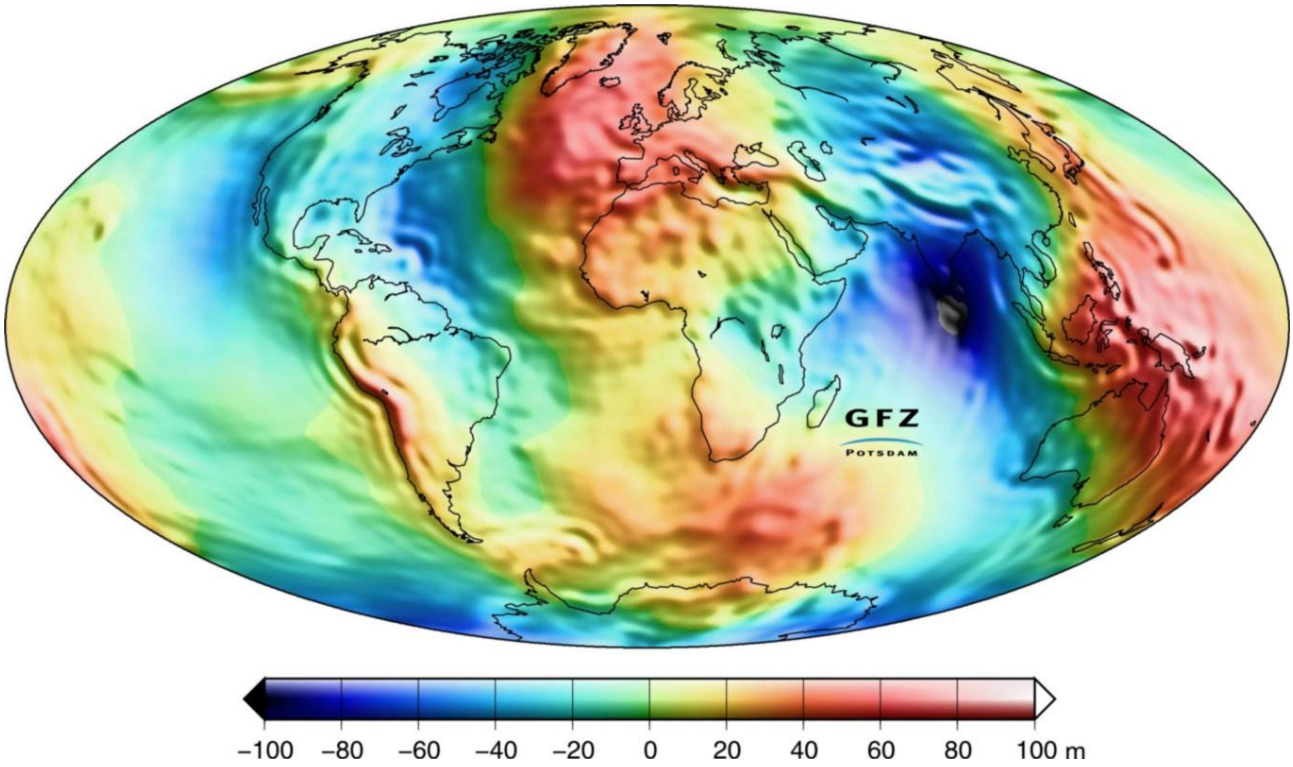



*Image credit: NASA / GRACE mission / Christoph Reigber, et al. (2005): An Earth gravity field model complete to degree and order 150 from GRACE: EIGEN-GRACE02S, Journal of Geodynamics 39(1),1–10. Reds indicate greater gravitational anomalies; blues are smaller ones.*