The Messenger
Mexborough & Swinton Astronomical Society February 2016

NORDINGEN

Nordlingen in the Donau-Ries district of Bavaria, Germany, has a special location. This pretty medieval town is situated entirely inside a massive meteorite crater 25 km across. This crater called the Nördlinger Ries, was formed some 14.5 million years ago when a meteor about a mile across slammed into Earth. It was only less than fifty years ago that evidence emerged which established the true origin of this town.

For years, it was believed that the shallow depression in the middle of which the town is situated was a volcanic crater. Then in 1960 two American scientists, Eugene Shoemaker (of comet Comet Shoemaker-Levy 9 fame) and Edward Chao, proved that the depression was in fact, caused by meteorite impact. While visiting a church in the town of Nordlingen, Shoemaker reportedly scratched its walls to see what it was made of and was delighted to discover shocked quartz, a type of rock that can only be formed by the shock pressures normally associated with meteorite impact. Subsequent exploration of the strange rock formations of the Ries conclusively established that the crater was caused by a meteor impact.

Stone buildings in the town contain millions of tiny diamonds, all less than 0.2 millimeters across. The impact that caused the Nördlinger Ries crater created an estimated 72000 tons of them when it impacted a local graphite deposit

There is another impact crater the Steinheim crater, about 3.8 km in diameter, located about 42 kilometers west-southwest from the centre of Ries. These two craters are believed to have formed nearly simultaneously by the impact of a binary asteroid.

The Ries Crater Museum is regarded as a special geological museum, the contents of which deal with a natural catastrophe which took place about 15 million years ago. The 'Meteorite Crater Nördlinger Ries', which was formed by the impact of an asteroid, is the result of this catastrophe. Along with it, the nearby 'Steinheimer Basin' was formed. These two geological features represent the only two confirmed impact structures in Germany.



The Thoughts of Chairman Les



I would like to welcome those of you that have become members since my last thoughts. You have joined the best society in the UK and I hope that you have many happy years with us.

Our Aquarius Project is moving along but be it slowly. YWS are very poor at getting back with their answers. We have made one or two offers for the purchase of the land at our site with little reply. We have put together the Access Document for RMBC Planning Dept. which should be forwarded to them very soon.

We are busy with our PVE's and visiting RSPB that have been very successful. Our visits to Wentworth Castle have quarantined for a while as the numbers attending being very low at our recent visits.

Three of our members, Phil, Les & Glenn together with Phil's son William, visited Boston Castle in Rotherham Saturday 23rd January'16 for a one night presentation with Our Neighbours in the Solar System and the Stellarium presentation. It is a very good place for this kind of thing and the organiser, Karen Nichols, Assistant Heritage Officer, Customer and Cultural Services, Environment and Development Services, Rotherham Metropolitan Borough Council was very pleased with the outcome of the afternoon. As we were leaving at about 7.00pm it was quite dark and it looked as though it would make a decent area for evening observing, deep sky objects might be difficult but the planets and of course the moon would be as accessible as the place is much like RSPB with all the rooms able to be used. Maybe this could replace Wentworth Castle.

We have much work planned for this year at least we'll see what next year holds, much of the same I would think.

Les Marsden

Two Mathematicians

Two mathematicians were having dinner.

One was complaining: '*The average person is a mathematical idiot. People cannot do arithmetic correctly, cannot balance a check book, cannot calculate a tip, cannot do percentages …'*
The other mathematician disagreed: '*You're exaggerating. People know the entire math they need to know*.'
Later in the dinner the complainer went to the men's room. The other mathematician beckoned the waitress to his table and said, '*The next time you come past our table, I am going to stop you and ask you a question. No matter what I say, I want you to answer by saying "x squared."*'
She agreed. When the other mathematician returned, his companion said, '*I'm tired of your complaining. I'm going to stop the next person who passes our table and ask him or her an elementary calculus question, and I bet the person can solve it.*'
Soon the waitress came by and he asked: '*Excuse me, Miss, but can you tell me what the integral of 2x with respect to x is?*'
The waitress replied: '*x squared*.'
The mathematician said, '*See*!'
His friend said, '*Oh … I guess you were right*.'
And the waitress said, '*Plus a constant*.'

BOSTON CASTLE



Our first gig at Boston Castle went down really well and was undoubtedly a success,
Myself and Les did a lecture, Les on his usual solar system and I did the usual planetarium show,
William and Glen helped out with the carrying setting up and ushering people around,
We had a display of meteorites and a separate display of Georgian astronomical instruments,
We had a full house of 30 people of all ages and questions and answers at the end,
We had several positive comments at the end and a good time was had by all,
Although the weather was bad on the night the view over Sheffield at night was a spectacle,
There is also an amphitheatre at the side of the castle which would suite the use of telescopes for future events,
The manager would love us to go back and do another turn later in the year in May with relation to the mercury transit,
Anyway thanks Les Glen and William for a great night out, two hours wasn't long enough.

Philip Muffett

SOLSTICE DINNER

Note: No extra charge for Non-Members, wives, children, siblings and others

FRIDAY JUNE 17th 2016 **ROCKINGHAM ARMS – Wentworth 7pm**

Menu

STARTER	MAIN	PUDS
Whitebait	Half Roast Chicken	Chocolate Fudge Cake
Stilton Mushrooms (V)	Roast Beef Topside	Ice Cream Sundae
Soup of the Day	Roast Pork	Apple & Blackberry Crumble
	Halloumi & Chips	

Keynote Speaker – We are hoping to bring in Alan Chapman
Wives, Girlfriends, Significant others, and even family members are invited too
Please indicate either on the form on the wall at the club room or by email to royg@gmx.co.uk – you will then be chased up for £5 deposit per person ASAP. At some stage near the event we will need to know your choice of menu. Cost £25 includes £5 deposit.

A Ninth Planet Discovered*?*

By Brian Ventrudo



It's been 170 years since the eighth (and so far last) major planet, Neptune, was discovered in our solar system. Pluto, of course, was discovered in 1930, heralded as the ninth planet, but then demoted by consensus of the astronomical community, largely at the behest of the Caltech astronomer Mike Brown who reasoned that Pluto was not large enough to gravitationally clear its path of other bodies, one of the three criteria for a major planet. In the ten years since Pluto's demotion, Brown has been asked if there are any other planets in our solar system. His answer: "Nope, that's it."

So it was a big surprise this week when the same Michael Brown and his Caltech colleague Konstantin Batygin announced research that suggests there is indeed a ninth major planet orbiting the Sun. They have not detected the planet directly, but they have inferred its presence by its gravitational effect on a handful of much smaller objects that revolve around the Sun in orbits far past Neptune. The motion of these small bodies has been a puzzle for some time because they tend to bunch up in their own orbital plane, a plane distinct from that of the inner planets in the solar system. The probability of such an arrangement just by chance is about 1 part in 14,000. So Brown and Batygin looked for another solution. When they ran a computer model of the motion of a handful of these small distant objects with a hypothetical large planet on the other side of the solar system, they were able to quite precisely explain the observed motions of these smaller objects.

Other solar-system researchers agree this is not the discovery of a new planet– not yet– but it is a first-rate analysis that suggests there is a very good chance a big planet is out there.

How far out there? Far. It's predicted to be in a highly elliptical orbit in which its distance to the Sun ranges from an estimated 30 billion to 160 billion kilometers. That works out to 215 astronomical units (AU) to 1075 AU, which compares to a distance to the Sun of 30 AU for Neptune and 40 AU for Pluto. To explain the gathering of smaller objects in the outer solar system, the hypothetical planet must be an ice-giant, somewhat like small Neptune, with an orbital period of 10,000 to 20,000 years and a mass of about ten Earths. That's more than massive enough to qualify as a major planet.

How did such a large planet get so far away from the Sun? After all, it's more than ten times the distance from the Sun to Neptune on average. The working theory is that it formed in the inner solar system at the same time as Jupiter, Saturn, Uranus, and Neptune, but it approached one of these planets too closely and got whipsawed to the outer solar system.

So the hunt is now on to find this ninth planet. Now provisionally called Planet 9, the distant ice giant is too dim to see in all but the worlds' largest telescopes such as the Subaru or Keck telescopes on Mauna Kea. Planet 9 is likely to be located on the opposite side of the solar system from where the orbits of the small bodies bunch up, but its precise location is unknown. Brown and Batygin expect a telescopic confirmation of the existence of Planet 9 some time in the next five to seven years.

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Andrew Kirton-Vaughan's February Skynopsis



Diary (all times GMT unless otherwise specified)

1st	*Moon at Last Quarter. Conjunction between Moon and Mars*
8th	*New Moon*
12th	*Conjunction between Moon and Uranus*
15th	*Moon at First Quarter*
22nd	*Full Moon*
25th	*Conjunction between Moon and Jupiter*
29th	*Conjunction between Moon and Mars*

The Planets

Mercury	*Not Visible*
Venus	*Not Visible*
Mars	*Visible for 4 hours before sunrise in Libra*
Jupiter	*Visible for 20:00 to 07:00 in Leo*
Saturn	*Visible for ½ hour before sunrise in Ophiuchus*
Uranus	*In Pisces. Sunset until 20:00*
Neptune	*Not Visible*
Pluto	*Not Visible*

Galactic Goodies:

Comets:	*C/2013 US10 Catalina – Visible @ Mag 6 and dimming to Mag 8. Fast Moving*
Globular Clusters	*NGC 2158 – Small cluster of intermediate age stars near M35. Mag 8.6*
Open Clusters	*M35 - in Gemini. Good binocular viewing. Over 100 stars. Mag 5.1* *NGC 2264 – The Cone Nebula / Christmas Tree Cluster*
Double Stars	*Delta Gemini (Wasat) - White primary & faint orange secondary.* *Eta Gemini (Mebsuta) – Yellow supergiant primary*
Variable Stars	*Zeta Gemini (Mekbuda) – Double Star. Primary is Cepheid variable with period 10.2 days.*
Planetary Nebula:	*NGC 2371/2372 – Double lobed nebula in Gemini. 13th magnitude.* *NGC 2392 / Caldwell 39 – The Eskimo Nebula*
Diffuse Nebula:	*Jellyfish Nebula – IC 443 in Gemini* *Rosette Nebula – Caldwell 49. Also includes open cluster Caldwell 50*

Tuesday Night Imaging Group

The Imaging group meets every Tuesday from 19:30 (ish) until late at the Observatory.
Now that the nights are drawing in and getting darker, the likelihood of being able to gather data is improving.
Even when the clouds roll in, we still attend and discuss processing techniques and learn from each other.
All data captured on any evening is available to those that attend for personal processing. We all started somewhere, and it's a good environment to learn in. All levels catered for.
Please feel free to join us, no appointment necessary.

Mike Scollan

Eisinga Planetarium

What is thought to be the oldest working planetarium in the worldis located in a room of a small house in the town of Franeker in the Netherlands. The house was originally owned by a a chap called Eise Eisinga a wool merchant who built this planetarium – actually a large orrery to inform the people of Franeker how the heavens worked.





Eisinga's planetarium was built at a time when the nation was gripped by panic and hysteria. It started with a small book published in 1774 by a Dutch preacher named Eelco Alta, from the Frisian village of Bozum, in which he made a clichéd yet terrifying prediction — the end of earth. Earlier, astronomers had announced that an unusual conjunction of the moon and the planets Mercury, Venus, Mars, and Jupiter was to happen on 8 May, 1774. Alta argued that on this very day, the planets and their moon would collide, with the result that the earth would be propelled out of its orbit and burned by the sun.



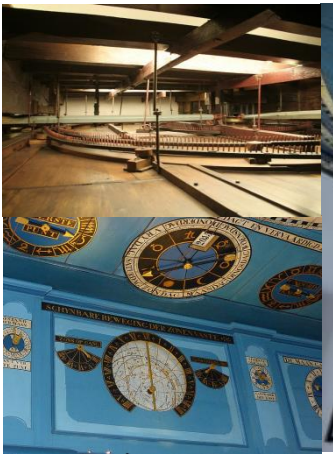
Eise Eisinga, who had mastered mathematics and astronomy in addition to combing wool, wanted to show there was no reason for panic. To prove Alta wrong and to reassure the Dutch people, Eisinga decided to build a planetarium in his living room.

The Eisinga Planetarium “hangs” from the ceiling — a golden orb, somewhat larger than a baseball, represents the sun and descends from the middle of the ceiling, with a number of other smaller orbs, representing the planets, rest in concentric grooves around the sun. A pendulum clock and a series of intricate mechanical gears, which Eisinga fashioned with his own hand, drives the planets at the precise rate they do in our solar system. This means that the Earth takes exactly 365 days to make one complete rotation. Mercury takes 88 days, Venus 224 days, Mars 687 days and Saturn over 29 years. These gears are located in the attic above the ceiling and hidden from view.

The planetarium was built at a scale of 1 millimetre: 1 million kilometers, so that it would fit on Easing’s living room ceiling. The planets, however, are not to scale because this would make them too small to see. In addition to the basic orrery, the model provides information such as time of sunrise and sunset, the phase of the moon and other astronomical phenomena. Aside from some minor adjustments that need to be made every four years to account for the extra day in a leap year, the model is still precise to this day.

Eisinga expected to finish the planetarium within six months, but it took him seven long years. He eventually completed it in 1781. The Eisinga Planetarium received a lot of visitors when it opened. When King William I visited the planetarium in 1818, he was so impressed that he subsequently bought it for the Dutch state.

Eisinga died in 1828, after which his son took over the running of the planetarium. The Eisinga family continued to run the planetarium until 1922. Since then, it's run by curators appointed by the city of Franeker.





Programme for February & March 2016

Date	Time	Location	Subject / Event	
Mon Feb 1st	18:80	Observatory	CAE - Mexborough Cubs	*Jez Robinson*
Thu Feb 4th	19:45	Club Room	"Beginners Guide to Astrophotography"	*Steve Bowden*
Wed Feb 10th	19:45	Club Room	Executive Committee Meeting	
Thu Feb 11th	18:30	Observatory	CAE – Goldthorpe Scouts	*Jez Robinson*
Thu Feb 11th	19:45	Club Room	Observatories of the UK	*Steve Taylor*
Fri Feb 12th	19:45	Observatory	PVE	*Les Marsden*
Sat Feb 13th	19:45	Observatory	PVE	*Les Marsden*
Mon Feb 15th	19:00	Observatory	Members Night – Lunar Viewing	*A Kirton-Vaughan*
Thu Feb 18th	19:45	Club Room	"Globular Clusters"	*Nate Bastian*
Sat Feb 20th	18:00	Clifton Park	PO –" Planets in the Park"	*Phil Muffett*
Mon Feb 22nd	18:45	Observatory	CAE – Barnsley Lundwood Scouts	*Jez Robinson*
Wed Feb 24th	18:30	Observatory	CAE – Chapeltown Beavers	*Jez Robinson*
Thu Feb 25th	19:45	Club Room	"The Spring Sky"	*A Kirton-Vaughan*
Wed Mar 2nd	18:45	Observatory	CAE - High Green Scouts	*Jez Robinson*
Thu Mar 3rd	18:45	Club Room	"Historical Novae"	*Gary Poyner*
Tue Mar 8th	18:45	Observatory	CAE - High Green Scouts	*Jez Robinson*
Wed Mar 9th	19:45	Club Room	Executive Committee Meeting	
Thu Mar 10th	19:45	Club Room	"Back to Basics"	*Paul D'Silva*
Tue Mar 15th	18:45	Observatory	CAE – St Thomas School, Kilnhurst	*Jez Robinson*
Wed Mar 16th	11:00		PO – St Thomas School, Kilnhurst Visit	*Alan Birch*
Thu Mar 17th	19:45	Club Room	TBA	*Phil Muffett*
Fri Mar 19th	19:45	Observatory	PVE	*Les Marsden*
Sat Mar 19th	17:00	Old Moor	PO - "Betelgeuse & Barn Owls"	*Les & Phil*
Thu Mar 24th	19:45	Club Room	"Astronomy Quiz"	*Roy Gunson*
Thu Mar 31st	19:45	Club Room	"It's about Time"	*Tony Morris*

Old Moor RSPB – Manvers Way, Barnsley, S73 0YF
Clifton Park –Clifton Lane, Rotherham, S65 2AA
Thryberg Country Park – Doncaster Rd, Rotherham, S65 4NU
PVE – Public Viewing Event – Bookings only
CAE – Community Access Event
PO – Public Outreach
TBA – To be announced (otherwise – we don't know!)

Web site: http://msas.org.uk
Meeting room is at Swinton Working Men's Club, Station Street, Swinton, South Yorkshire, S64 8AU.
Observatory is at Lee Brook Lane, Hoober, S62 7SH
Mexborough & Swinton Astronomical Society is Registered Charity N° 1064103 in England & Wales

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