

NORMAN LOCKYER OBSERVATORY SOCIETY LIMITED
2022 ANNUAL GENERAL MEETING

Minutes of the AGM held on 14th November 2022

1. Welcome and Apologies

- a. Meeting commenced at 7:36pm
- b. Apologies received from:
 - Dave Alexander
 - Jo Evans
 - Ian Grant
 - Heather Grant (Spratt)
 - Jeff Legg
 - Neil Morley
 - Kerry Powell
 - Jeff Ridge
 - David Smith
 - Karen Williams
 - Helen Wilson

2. To approve the Minutes of the 2021 Annual General Meeting

Proposed by Alan Green, Seconded by Kathleen Dollery → Approved

3. To receive the Annual Report from the Chairman

Proposed by Bill Hitchings, Seconded by Mike Hutchings → Approved

- Huge increase in visitor numbers for open evenings and afternoons.
- Looking to change the programme for 2023 to include some Saturdays for open evenings/afternoons.
- Appendix 1 – A call for more volunteers!
- Appendix 2 – Strategy Group.
- Appendix 3 – Beatrice Steele and the Lantern Slide collection.
- Appendix 4 – Reinstatement of the Mond Equatorial at the NLO.
- Appendix 5 – ASlair Plus and ASI533MC colour camera for the Victoria Telescope.
- Appendix 6 – Proposal to install solar panels at the NLO. The NLO's energy bill is increasing from ~ £2.5k per year to nearly £8k. To offset some of the increase we propose to install solar panels at the NLO. This will include an array of 26 400W panels, ground mounted to the NE/NW of the Kensington Dome, and also includes a Solaredge Hybrid Inverter and battery storage system.
- Appendix 7 – Reciprocal visits to the Flamsteed Astronomy Society. In September 2022 Grey Liple, a member of the Flamsteed Astronomy Society which is based at the Royal Observatory (GRO) / National Maritime Museum in Greenwich, visited the NLO and met with the Chairman and some of the members. The aim of the meeting was to explore ways to strengthen ties between the NLO and GRO, including visits by NLO members to the GRO.

4. To receive the Accounts for the year ended 31st March 2022

Proposed by Pete Youd, Seconded by Des Howlett → Approved

The NLO lost around one third of its members following the Covid-19 pandemic. We were able to reopen to visitors in January 2022 and brought in £1,900 of entrance fees in the two-month period between then and the financial year-end in March 2022 (2020-21 entrance fees = £nil).

The NLO is in a good financial position helped immeasurably from inheriting £27k from Colin Harris, an NLO member who passed away and left the NLO half of his estate. An additional £7k has been received since then in the 2022-23 financial year. The NLO was also supported by the government Covid-19 grants as the NLO site houses a rateable building. Total such grants received were £10,667. Finally, Sidmouth Town Council gave the NLO £2,200 to update the foyer, for which our thanks are given.

The NLO was fortunate to be on a fixed price electricity tariff for the 2021-22 period as prices have since risen threefold. We are hoping that the government will step in to help, British Gas have given up trying to calculate the bill!

The NLO has a healthy balance sheet. The site is leased from East Devon County Council (EDDC) with the current lease expiring in 2035. EDDC has agreed to extend the lease by 10 years to 2045 in return for extending the Lockyer Technology Centre and building the Jean Edyvean Education Centre. The EDDC legal department have not yet signed this off formally, the NLO Chairman has been chasing this matter. Monies paid for the lease are written off over the lease period.

5. To reappoint as the Society's Accountants Easterbrook Eaton Limited and to authorise the Directors to fix their remuneration

Proposed by Bill Hitchings, Seconded by Hugh Taylor → Approved

6. To appoint Directors

There were four nominations and four vacancies.

- Phil Smith was elected as a new director.
- Ken Bailey, Bill Hitchings and Kathleen Dollery were re-elected as directors.
- For all director appointments: Proposed by Alan Green, seconded by Sandy Moreton → Approved

7. Any Other Business (AOB) and other matters arising

- a. Phil Smith has taken over the maintenance of the Planetarium from Pete Bradley and Brian Ward-Smith. Many thanks to Pete and Brian for their work on this.
- b. History Group – thanks to Keith Orrel for running the group so well. Planning on standing down at the end of 2022. Met 10 times in the last year, earlier meetings on Zoom, more recently simultaneous meetings on Zoom and in-person. Preference for members to join in-person as harder to get coherent discussions on Zoom than when all meeting in-person. Discussions at the end are an important part of the meetings. Main talk + anniversary talk based on date of NLO meeting and how it coincides with birth/death of famous scientist. Sir Isaac Newton, Irwin Shrodinger, Heisenberg, Tesla etc. More topical subjects such as Covid, Energy & climate, the element Carbon and Hydrogen, JWST, history of the NLO's 30 inch common mirror etc. Meetings well supported but in recent months reticence of members to offer talks, left to the same 3 or 4 people. Wish to widen the type of talks offered, vary the length of talks → considering changing the format of meetings in the coming months. Bob Miles has found similar issues with running the monthly Monday meetings so make sense to combine the two groups. History met on Tuesday afternoon, so if merge where and when best to meet. Founded in 1999 and planned for retired members, hence the afternoon slot. Still relevant as most attendees are retired, hence considering sticking with an afternoon slot.

Bob – Monday monthly talks. Similar topics to the History group. Make sense to combine the two programs. Same people come to both meetings.

- c. Friday members' meetings – A membership survey was sent out to members looking at how to get people back to the NLO on a Friday night. Comparing with other Astro Societies, most have 1 talk per month compared with the NLO holding nearly 100 talks per year. Did we want to try to continue? What did members actually want? Hence survey. Survey results – 45% consider themselves active members, majority of others would like to become more active. Members responses suggested that practical sessions, observing, wanting to get together and be sociable, outside speakers etc. would all encourage members to return onsite. Friday was still the most popular day for members. 57.4% of member responses said that talks were pitched at about the right level. Members want to do observing and imaging and observe everything – the Moon, the Sun, planets, etc. Forthcoming meetings! Overall summary:
 - Continue with Fridays for Members' nights.
 - Don't exclude members who can't attend in person, so keep some Zoom sessions.
 - People want to observe (weather permitting!)
 - Provide training
- d. Website – the NLO website now has an agenda on the front page, thanks to Stephen Walker, which can be updated instantaneously by anyone with access rights.

- e. Astroscouts – currently operating on a Saturday evening which is considered safer because the front door can be locked. In addition, the Astroscouts have the building to themselves so there are no noise concerns. No impact if an open evening is held on a Saturday evening. Current group is young, Andy Anning has got a group together to help teach.
- f. Alan Brittain – the outside of main building has been painted, colour matched Portland Grey to 10-12 years ago. The Victoria dome will be painted. The McClean and Lockyer can't be painted due to being listed buildings. There is a new Conservator at the Council, once it's ascertained who it is hopefully we can get a schedule of works underway. Listed status means that we can paint buildings but not domes. Clause 96 and 96a can paint with same paint but don't want to, want to change colour. Doors on McClean repaired last year under like-for-like but cannot make changes without prior agreement. Longer it takes to get approval the worse things get. Approval for some roof repairs. Phil and David Smith passed by Alan to use the Lockyer Dome, 5 weeks (average 6 weeks) for 2-hours sessions, 8 weeks to use the Kensington.
- g. Cosmology group – thanks to Mike Curran for taking on the Cosmology Group. Leigh Edwards started the group ~ 3 years ago, meet once a month, 4th Thursday of the month on Zoom. Leigh recently stood down from assisting due to other commitments and we thank him for his input. Each session commences with a ½ hour beginner's session, answering queries on topics not understood by attendees. Then Mike does a roundup of Cosmology related news, ¾ hour, followed by a discussion on specific topic. Members welcome to email Mike with particular topics that they would like info on, preferably running this part of the session themselves! Email list 50-60 members, usually have 15-20 who dial in on a good night. Hoping to revert to holding sessions onsite at the NLO but with geographical distribution of members will always have to be a joint onsite/Zoom meeting.
- h. Alan Green – many thanks to those who have come up on a Thursday over the last few years. A huge amount of work has been undertaken with some fantastic changes. Phil Smith is now looking after Planetarium and the NLO has a new kitchen. 16th December, some form of Christmas function, mulled wine. Christmas quiz run by David.
- i. Vote of thanks for David Strange for being the Chairman for the last year.

The meeting concluded at 8:59pm.

Appendix 1 – A call for more volunteers please!

Further to the recent email sent out by Pete Youd, we are always on the lookout for volunteers to help with Public Open evenings, Private Group Visits and also help to run the Astroscouts.

We are now seeing a huge increase in visitor numbers since the pandemic, and we do need a large team of volunteers to manage this successfully. We have a hard-core team of volunteers who are currently turning up at every occasion, but we do want to avoid burn out!

YOUR HELP WOULD BE VERY MUCH APPRECIATED

A great Shout-out to new volunteer Edward Coleman who has helped on the last 20 out of 23 Open evenings! Also, thanks to Alex Rowe who has been a great help.

Appendix 2 – Proposal to form an NLO Strategy Group

We are looking for a small group of members (not all NLO Directors!) who would form a brainstorming/ideas group to help plan our way ahead.

Items that could be covered include:

- An ideas forum for setting agenda for our public open evenings – themes, frequency, calendar?
- Suggestions and ideas for Friday evening NLO sessions – Talks, observing sessions, instructional courses?
- Frequency and ideas for Group visits.
- Long term planning and development of NLO facilities.

Essentially the idea is to create a forum to discuss the general operation of what the NLO does and how to encourage others to get involved.

Meetings would likely be held six-monthly or quarterly. Probably 5-6 people at most and those who are most active in helping (or wishing to help) sort out the NLO's current issues!

Appendix 3 – Introducing Beatrice Steele

Beatrice has been awarded a Collaborative Doctoral Award with the topic “Imaging the Heavens: the Scientific and Cultural Significance of the Norman Lockyer Observatory’s Image Archive” .

This is a two-year research project into the NLO’s Lantern Slide and historic plate archive collection. Beatrice will be a regular visitor to NLO for the next 6 months, probably two or three times per week. She will have access to the NLO Archives in the Darkroom and will study in the JEC.

Beatrice’s supervisors are Prof. Jason Hall (Exeter), Prof. Martin Willis (Cardiff) & David Strange.



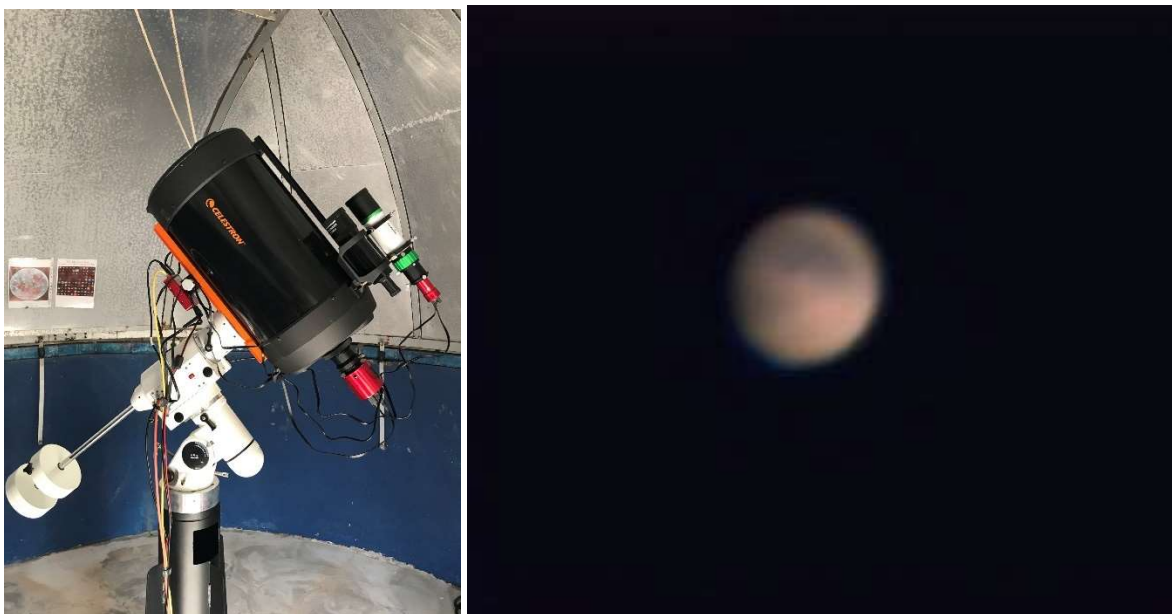
Appendix 4 – Reinstatement of the Mond Equatorial at the NLO

Following on from the bequest of the late Dr Glyn Marsh we are proposing to erect the Mond Equatorial in the alcove adjacent to the lecture theatre.



Appendix 5 – ASlair Plus and ASI533MC colour camera

The Victoria Telescope is now equipped with an ASlair Plus and ASI533MC colour camera. This telescope can now be remotely controlled from the Lecture Theatre.



Appendix 6 – Proposed Hybrid Solar PV system



The Old School, Clyst Honiton, EX5 2LZ

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e: enquiries@rudgeenergy.co.uk

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10th August 2022

David Strange
Norman Lockyer Observatory
Salcombe Hill
Sidmouth
EX10 0NY

Reference: **Proposed Hybrid Solar PV system**

Dear David

Thank you for inviting me to carry out a quotation for a Solar PV and Battery storage system at your premises.

I have put together a quotation for 26 panels on a ground mount array at the location indicated on the aerial photo at the end of this quotation. We do have the options of installing the system on the flat roof, or on a ground array. Though a ground array will require planning permission, annual generation, especially in the Winter months, will be far higher than roof mounting with their inherent low panel angles of 10 or 15 degrees.

The Solar PV inverter and batteries will be installed in the Kensington dome adjacent to the incoming power for the site and connected to the grid at the same location.

This design uses a 3 phase solar edge inverter, together with a set of BYD Lithium batteries. I have included for 4 @ 4kwh BYD modules, though more can be fitted, either at the time of installation, or at a later date. You will see at the end of the quote the option for more storage. As the system in the summer months could easily generate 40kWh a day, an additional battery would help retain more excess solar generation for evening use. However, that can be countered with a low amount of excess solar generation during the Winter months, and during this period I would anticipate most of the solar generation will be used to cover daytime power use along with some modest storage of excess power.

If you wish to proceed with the installation, we will send you a 50% deposit request to allow us to secure the works. The final 50% payment will be made on completion and handover of the system.

Yours sincerely

Chris Rudge

Appendix 6 continued – Proposed Hybrid Solar PV system

System Proposal

Installation of a **10.4kWp** Solar PV system at:

Norman Lockyer Observatory,

On a Southerly facing Ground array, we will install:

26 @ 400Wp All Black Monocrystalline PV modules onto a ground mounted K2 aluminium and stainless steel mounting system at 30 degrees for optimum year round generation.

All panels will be installed with a Solar Edge optimiser

We will install a **Solaredge 10kW Hybrid G99** compliant grid connected inverter onto a supplied equipment board at a location to be arranged inside the plant room at a suitable location near to the distribution board.

Connected to the Solaredge Hybrid Inverter, we will fit **16kWh of Lithium Ion BYD LVS** batteries This will be installed adjacent to the inverter.

The whole system will be monitored through the SolarEdge Portal monitoring using your existing internet connection. which will monitor your imported and exported power as well as generated power on the new system.

Together with the inverter AC & DC isolators will be fitted.

Adjacent to the inverter we will install an OFGEM approved total generation meter and an isolate switch for electrical safety.

We will install a new MCB in your consumer unit, ensuring our PV system complies with current 18th edition electrical regulations.

It is estimated these works will take no longer than 5 days

Power Generation

The completed 10.4kWp system at the South facing location with shading, will generate 10560 kWh (units) of electrical power each year based on the approved MCS calculations. *Disclaimer: "The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the standard MCS procedure and is given as guidance only. It should not be considered as a guarantee of performance"* This shade assessment has been undertaken using the standard MCS procedure – it is estimated that this method will yield results within 10% of the actual annual energy yield for most systems

Appendix 6 continued – Proposed Hybrid Solar PV system

There are three main components of a solar PV system:

1. The Solar Array – ground mounted
2. The Inverter
3. The Battery Storage facility

See below. Yellow line indicates approximate position of the ground array. 13.5mtrs long.



Appendix 6 continued – Proposed Hybrid Solar PV system

Solar Inverter – converts 12 DC from the panels into 240V AC.

Three Phase Inverter

SE3K - SE10K



**12-25
YEAR
WARRANTY**

INVERTERS

Specifically designed to work with power optimizers

- ✓ Noise level suitable for residential environments – No external fan
- ✓ Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- ✓ Small, lightest in its class, and easy to install
- ✓ Built-in module-level monitoring
- ✓ Superior efficiency (98%)
- ✓ Internet connection through Ethernet or Wireless (Wi-Fi, ZigBee Gateway, Cellular)
- ✓ IP65 – Outdoor and indoor installation
- ✓ Fixed voltage inverter for longer strings
- ✓ Smart Energy Management control

solaredge.com



Appendix 6 continued – Proposed Hybrid Solar PV system

The battery can be charged from the solar panels or by making use of the cheaper night time tariff.

The total cost of this PV installation will be £20,178 excluding VAT. Based on the annual generation figure from MCS calculation this system design will earn:

- £3,421.00 estimated electricity bill offset via 'free to use' electricity generated per annum.
- CO₂ saved from the PV system generation: 2,966 kg per annum.

BATTERY-BOX PREMIUM LVS

- Scalable from 3.8 kWh to 245.8 kWh
- Maximum Flexibility for any Application with up to 64 modules Connected in Parallel
- Compatible with Market Leading 1 and 3 Phase Inverters
- Cobalt Free Lithium Iron Phosphate (LFP) Battery: Maximum Safety, Life Cycle and Power
- Capable of High-Powered Emergency-Backup and Off-Grid Function
- Patented Internal Plug Design Requires No Additional Wiring
- Self-Consumption Optimization for Residential and Commercial Applications



Appendix 7 – Reciprocal visits to the Flamsteed Society

Visits to the Norman Lockyer Observatory (NLO) – to get things started ideas which might appeal to the Flamsteed members were suggested at the meeting, including a daytime lecture on the History of Astronomy with a tour of the domes and historic equipment, including the old planetarium from the Royal Greenwich Observatory. Maybe include a picnic.

Visits to the Greenwich Royal Observatory (GRO) – relatively few NLO members have visited the GRO nor the Maritime Museum so the following ideas were met with great enthusiasm:

- An invitation for NLO members to attend one of more of the GRO's lectures, preceded by a personal tour of the Royal Observatory.
- An invitation for NLO members to attend one or more of the GRO's solar viewing events with a picnic in the secluded garden on the slopes beneath Flamsteed House.
- An invitation for NLO members to view the Great Equatorial 28-inch Telescope with a personal talk followed by a quick visit to the where the NLO's planetarium used to be housed, followed by a Harrison Planetarium show.
- A tour of the Greenwich Observatory focusing on navigation, the Harrison clocks plus a boat trip on the Thames to illustrate how ships of that time set their timepieces using the Red Time Ball and how the Navy used the mighty river.

Discussions including logistics and the possibility of using a local coach company to get everyone to and from London, as has been done on previous excursions.

