



## **STFC Science Board 82nd meeting 23 and 24 February 2021, via videoconference Meeting Summary**

Professor Tara Shears chaired the meeting. The Chair welcomed Professor Carla Andreani, Professor George Efstathiou, Dr Isabel Moraes and Professor Zulfikar Najmudin to Science Board as this was their first meeting as Board members.

### **International Facility Update**

Science Board received a presentation and overview of the international facilities portfolio from Rachel Reynolds and Helen Beadman. The update included the following facilities: ESRF, European XFEL, ILL, ESS, ELI, SKA, ESO, ELT, CTA and FAIR.

### **Facility Directors Update and Technician's Commitment Update**

The Board received presentations from the Facility Directors of the Large Scale Facilities: Professor Robert McGreevy (ISIS), Professor Andrew Harrison (DLS) and Professor John Collier (CLF). The Facility Directors provided an update on the facility's priorities, research outcomes of note and user and community concerns.

The Board heard from Richard Smith, Mat Beardsley and Erik Johnson (Members of STFC's Technician's Commitment Working Group and Steering Group) on the [Technician's Commitment](#) and the work to date by the Technician Group, including the development of an action plan.

### **Science Board Membership Call 2021**

Science Board received an overview of the outcomes from the 2020 membership call and an overview of the upcoming 2021 campaign. Science Board were invited to comment on the Science Board selection criteria with the aim of improving inclusivity in the language.

## **Advisory Panel Updates**

Science Board were provided with an update from the Chairs of the Life Sciences & Soft Materials Advisory Panel (LS&SM, Dr Susan Quinn) and the Physical Sciences & Engineering Advisory Panel (PS&E, Dr Kate Lancaster). Science Board heard from the panels on recent activities, scheduled work the panel will be undertaking over the coming year, the role of the panels and highlights of scientific discoveries or scientific areas of emerging interest. The panel also had the opportunity to discuss any concerns from the panel or community.

Links to the scientific highlights presented can be found in [Annex 1](#).

## **Funding Advice and Recommendations**

Science Board considered the following Projects Peer Review Panel (PPRP) reports and Grants Panel reports:

- The New Robotic Telescope (NRT) PPRP
- The Solar Multi-Conjugate Adaptive Optics (MCAO) PPRP
- Gravitational Waves grants panel report

## **Infrastructure Prioritisation Update**

Science Board received an update on the revised process of the planned Infrastructure Prioritisation process for 2021 from Dr Ailidh Woodcock and Philip Amison and invited the Board to comment on the assessment criteria.

## **Standing items**

The minutes and actions from the December 2020 meeting were reviewed and the Chair and Deputy Chair provided the Board with an update on any matters arising from Council and recent Town meetings.

Science Board received an update and additional commentary on the STFC update report from Professor Mark Thomson, Executive Chair of STFC, which included an update on: the occupancy of science sites due to COVID-19; new Council members; the spending review; the review of space related activities in the UK; the 1<sup>st</sup> Council meeting for the Square Kilometre Array (SKA); and the CERN Council governance.

Information papers included, an SKA Construction Grant Review and the [National Audit Office Report: UKRI's Management of ISCF](#), which were noted by Science Board.

### **Date of Next Meeting**

The next Science Board meeting will be held on 20 and 21 April (83rd meeting) 2021 by videoconference.

A list of acronyms for this summary can be found in [Annex 2](#).

## Annexes

### Annex 1: Links to scientific highlights presented by Advisory Panels

#### LS&SM:

1. A Single-Component Photorheological Fluid with Light-Responsive Viscosity, E. A. Kelly, N. Willis-Fox, J. E. Houston, C. Blayo, G. Divitini, N. Cowieson, R. Daly and R. C. Evans, *Nanoscale*, 2020, 12, 6300-6306. (Hot Article)
2. 3D Correlative Cryo-Structured Illumination Fluorescence and Soft X-ray Microscopy Elucidates Reovirus Intracellular Release Pathway. I. Kounatidis, Stanifer ML, Phillips MA, Paul-Gilloteaux P, Heiligenstein X, Wang H, Okolo CA, Fish TM, Spink MC, Stuart DI, Davis I, Boulant S, Grimes JM, Dobbie IM, Harkiolaki M. *Cell*. 2020, 182, 515-530.
3. Visualizing the protons in a metalloenzyme electron proton transfer pathway, H. Kwon, J. Basran, J.M. Devos, R. Suardíaz, M. W. van der Kamp, A. J. Mulholland, T. E. Schrader, A. Ostermann, M. P. Blakeley, P. C. E. Moody, and E. L. Raven *PNAS*, 2020, 117, 6484.
4. Molecular basis for control of antibiotic production by a bacterial hormone. S. Zhou, H. Bhukya, N. Malet, P. J. Harrison, D Rea, M .J. Belousoff, H. Venugopal, P. K. Sydor, K. M. Styles, L. Song, M. J. Cryle, L. M. Alkhalaf, V. Fülöp, G. L. Challis, C. Corre, *Nature*. 2021 doi: 10.1038/s41586-021-03195-x.
5. Unraveling the Mechanism of a LOV Domain Optogenetic Sensor: A Glutamine Lever Induces Unfolding of the J $\alpha$  Helix. J. N. Iuliano, J. T. Collado, A. A. Gil, P. T. Ravindran, A. Lukacs, S.-Y. Shin, H. A. Woroniecka, K. Adamczyk, J. M. Aramini, U. R. Edupuganti, C. R. Hall, G.M. Greetham, I. V. Sazanovich, I. P. Clark, T. Daryaei, J. E. Toettcher, J. B. French, K. H. Gardner, C. L. Simmerling, S. R. Meech, and P. J. Tonge, *ACS Chem. Biol.* 2020, 15, 10, 2752–2765.
6. Single molecule protein stabilisation translates to macromolecular mechanics of a protein network. M. D. G. Hughes, S. Cussons, N. Mahmoudi, D. J Brockwell, L. Dougan, *Soft Matter*, 2020,16, 6389-6399.
7. Caught in the Loop: Binding of the [Ru(phen)<sub>2</sub>(dppz)]<sup>2+</sup> Light-Switch Compound to Quadruplex DNA in Solution informed by Time-Resolved Infrared Spectroscopy. S. J Devereux Dr. Stephen J. Devereux, F. E. Poynton, F. R. Baptista, T. Gunnlaugsson, C. J. Cardin, I. V. Sazanovich, M. Towrie, J. M. Kelly, S. J. Quinn *Chem. Eur. J.* 2020, 26, 17103.

8. How do Self-Assembling Antimicrobial Lipopeptides Kill Bacteria? Gong et al, ACS Appl. Mater. Interfaces 2020, 12, 50, 55675.
9. Controlled Dendrimersome Nanoreactor System for Localized Hypochlorite-Induced Killing of Bacteria, M. Potter, A. Najer, A. Klöckner, S. Zhang, M. N. Holme, V. Nele, J. Che, L. Massi, J. Penders, C. Saunders, J. J. Douth, A. M. Edwards, O. Ces, M. M. Stevens, ACS Nano 2020, 14, 12, 17333.
10. Wu, Y., Okesola, B.O., Xu, J. et al. Disordered protein-graphene oxide co-assembly and supramolecular biofabrication of functional fluidic devices. Nat. Commun. 2020, 11, 1182.
11. Ammonia Storage in Hydrogen Bond-Rich Microporous Polymers. R. J. S. Lima, D. V. Okhrimenko, S. Rudić, M. T. F. Telling, V. G. Sakai, D. Hwang, G. Barin, J. Eckert, J.-W. Lee, H. N. Bordallo; ACS Appl. Mater. Interfaces 2020,12, 58161.

**PS&E:**

1. Xu, C., Märker, K., Lee, J... Grey, C et al. Bulk fatigue induced by surface reconstruction in layered Ni-rich cathodes for Li-ion batteries. Nat. Mater. 20, 84–92 (2021). <https://doi.org/10.1038/s41563-020-0767-8>
2. A Simonov, T De Baerdemaker, H L B Boström, M L Ríos Gómez, H J Gray, D Chernyshov, A Bosak, H-B Bürgi & A L Goodwin, Hidden diversity of vacancy networks in Prussian blue analogues. Nature 578, 256 (2020)
3. R. J. Shalloo, S. J. D. Dann, J.-N. Gruse, C. I. D. Underwood, A. F. Antoine, C. Arran, M. Backhouse, C. D. Baird, M. D. Balcazar, N. Bourgeois, J. A. Cardarelli, P. Hatfield, J. Kang, K. Krushelnick, S. P. D. Mangles, C. D. Murphy, N. Lu, J. Osterhoff, K. Pöder, P. P. Rajeev, C. P. Ridgers, S. Rozario, M. P. Selwood, A. J. Shahani, D. R. Symes, A. G. R. Thomas, C. Thornton, Z. Najmudin & M. J. V. Streeter, Automation and control of laser wakefield accelerators using Bayesian optimization. Nature Communications volume 11, Article number: 6355 (2020)

## **Annex 2: Acronyms**

**CLF:** Central Laser Facility

**CTA:** Cherenkov Telescope Array Observatory

**DLS:** Diamond Light Source

**ELI:** Extreme Light Infrastructure

**ELT:** Extremely Large Telescope

**ESO:** European Southern Observatory

**ESRF:** European Synchrotron Radiation Facility

**ESS:** European Spallation Source

**European XFEL:** X-ray Free-Electron Laser

**FAIR:** Facility for Antiproton and Ion Research

**ILL:** Institute Laue-Langevin

**ISCF:** Industrial Strategy Challenge Fund

**LS&SM:** Life Sciences & Soft Materials Advisory Panel

**PPRP:** Projects Peer Review Panel

**PS&E:** Physical Sciences & Engineering Advisory Panel

**SKA:** Square Kilometre Array