**SSAC Meeting - Wednesday 11 September 2013**

**Scottish Government, St Andrews House**

**Regent Road, Edinburgh, EH1 3DG**

**Attending:** Professor Muffy Calder

Dr Chris Masters

Professor Ian Boyd

Professor Nigel Brown

Professor David Cumming

Mr Stuart Farmer

Professor James Hough

Professor Julian Jones

Professor Jon Oberlander

Professor Marian Scott

Professor George Salmond

Mrs Anna Milne SSAC Secretariat

Ms Clare Hicks Office of the Chief Scientific Adviser

Mr Douglas Brown, Office of the Chief Scientific Adviser

Professor Louise Heathwaite, Chief Scientific Adviser, Rural Affairs and the Environment, Scottish Government (ex-officio member)

**Apologies:** Professor Ian Diamond, Dr John Brown and Professor Jason Reese and Mrs Angela Mathis

**External attendees for item 4:** Professor Miles Padgett, University of Glasgow

External attendee for item 5: Dr Rebekah Widdowfield, Head of Higher Education and Learner Support, Scottish Government (for lunch and agenda item 5 only)

**1. Welcome:**

1. Professor Calder welcomed members to the meeting. She gave apologies from Professor’s Diamond and Reese, Dr John Brown and Mrs Angela Mathis. She welcomed Ms Clare Hicks who had recently been appointed as Head of the Office of the Chief Scientific Adviser.

**2. Work Programme Update – Synthetic Biology**

2. Professor Nigel Brown, Chair of the working group on Synthetic Biology updated the meeting on progress with the workstream since the last meeting in June. He noted that while members of the working group had specific expertise in this area he looked to the wider Council members for their assistance in reviewing the outputs of the workstream and providing a critical eye on the report as it develops.

3. Professor Brown thanked Mr Ian Archer, Head of Process Development at Ingenza for his presentation to the Council the previous evening. Mr Archer had given an interesting presentation on the potential industrial applications and opportunities of Synthetic Biology (Industrial Biotech). He focused in particular on Ingenza and how the company had evolved into the business it was today and what he saw as the potential growth areas for the future.

***Scoping Document***.

4. Professor Brown presented Council with the revised version of the project scoping document for their consideration and asked Council to approve the document. Council members approved the revised version.

6. He noted that since the last meeting the focus of the workstream had moved from GM to Synthetic Biology. He further noted that the process to appoint a research assistant to support the workstream had commenced and that a procurement exercise was underway to identify a suitable contractor. It was hoped that an individual would be appointed by the end of September and work would commence in early October. Professor Brown suggested that following her informative and influential presentation at the June meeting SSAC invite Professor Tait to join the Synthetic Biology working group the Council agreed.

7. Professor Brown noted that the group had compiled a comprehensive list of stakeholders and that the list would now need to be prioritised and grouped. He noted that the working group intended holding a number of stakeholder meetings during November and early December however they also planned to gather evidence from a number of stakeholders, including the NGO’s, on a one to one basis.

8. Professor Brown presented a further paper and he noted that the working group had initiated an initial information gathering exercise and had produced this paper, which set out a general introduction to Synthetic Biology, its use in a range of different areas and some of the social acceptability issues associated with its use. He highlighted that the group had identified five main work areas where they planned to focus their activity this included; research, medical and pharmaceutical, agriculture and industry/energy.

9. Professor Brown invited comments from the Council on both the scoping paper and the introductory paper. Following a short discussion Professor Brown thanked colleagues for their comments and reported that once the researcher was in place work would commence on the reviewing the existing literature and planning the stakeholder events.

**3. Science and Independence Debate**

10. Dr Masters presented Council with the final draft of the Implications for Science in the Independence Debate paper for consideration. Dr Masters reported that 83 organisations had been contacted and 26 responded the resulting paper was a summary of those views submitted. He explained that the paper as drafted does not represent the collective view of the SSAC or its members, but seeks to act as a basis for informed discussion.

11. Members suggested that the report should make clear that the Scottish scientific community would welcome further discussion and debate to further support scientific excellence.

12. The Council members agreed that the report be published on the SSAC website before the 17 October.

13. The Co-Chairs thanked members for their comments and agreed to re-draft the report as discussed. The revised version would be circulated to members for final approval.

**4. Cutting edge science presentation – Professor Miles Padgett (University of Glasgow)**

**Optics (3D Computational Ghost Imaging)**

14. Professor Calder introduced Professor Miles Padgett from the University of Glasgow. She reported that the Co-Chairs were piloting a potential new rolling agenda item which will look at new and emerging areas of science. She explained that Co-Chairs would like to invite key researchers to present to SSAC at each meeting. It is hoped that this will inform SSAC thinking and highlight areas of science and engineering where Scotland is taking a leading role or there are particular economic or social benefits to Scotland of that area of science. Following the presentation and discussion SSAC can then decide where there are any issues that should be brought to the attention of Government or if there are other connections that SSAC could helpfully facilitate. The Co-Chairs hoped that this new agenda item would ensure that SSAC keeps in touch with cutting edge science even if SSAC were not meeting out in the science community as regularly. She invited member’s feedback.

15. Professor Padgett thanked the Co-Chairs for the opportunity to present to SSAC. He explained that he is Professor of Optics in the School of Physics and Astronomy at the University of Glasgow. He heads a team covering a wide spectrum from blue-sky research to applied commercial development, funded by a combination of government charity and industry. He explained that his research interests are in the field of optics and in particular of optical angular momentum. His contributions include an optical spanner for spinning micron-sized cells and use of orbital angular momentum to increase the data capacity of communication systems.

16. Professor Padgett gave a short presentation on his research on 3D computational ghost imaging. He explained that computational ghost imaging is an alternative technique to conventional imaging that removes the need for a camera. Instead, ghost imaging illuminates the scene with a series of known patterns and infers the image from the backscattered intensities, measured with a single point detector. He noted that a few seconds of data is sufficient to obtain both 2D and 3D image reconstructions. Professor Padgett explained that this approach is of particular relevance for imaging out with the visible spectrum where the availability of cameras is limited. He gave the following examples of where this technique might lead for example:

* Imaging at non visible and or many wavelengths
* Imaging of gas
* Medical imaging
* Imaging of polarisation anomalies

17. Professor Padgett then gave SSAC an overview of the new International Max Planck Partnership between the physics schools of a number of Scottish Universities and a number of Max Planck Institutes. He noted the partnership would be launch at the Royal Society of Edinburgh on 19 December.

18. He reported that the Scottish Universities currently involved in the partnership are Glasgow, Strathclyde, St Andrews, and Heriot-Watt with Edinburgh in the process of joining. Professor Padgett noted that the Partnership is focused on research on Observation and Measurement at the Quantum Limit, an area which has many spin-off possibilities from gravimeters for oil wells to techniques for quantum computing, areas which will be of relevance to the new Scottish Innovation Centre in Sensors and Imaging and to the new Fraunhofer Centre in Applied Photonics. Initial funding for the partnership is from EPSRC, STFC, SFC and each of the participating universities. It is expected that this initial funding will support leverage of further research council and Horizon 2020 funding. Professor Padgett suggested that the collaborative nature of the research to be undertaken will significantly strengthen scientific links between Scotland and Germany.

19. Professor Padgett explained that while this was initially a virtual initiative there were plans of making the virtual real and creating a physical site at the University of Glasgow a ‘quantum technologies centre’ - a 21st century home for 3 of Glasgow’s research jewels:

* Quantum Science
* Quantum Fabrication
* Science of Big Data

20. Professor Calder thanked the Professor Padgett for his presentation and opened the discussion to members for questions and comments. The members asked a number of questions and briefly discussed the easy access IP policy at the University of Glasgow.

**5. Future of Research Funding – Presentation and Discussion with SSAC**

**Dr Rebekah Widdowfield**

21. Professor Calder welcomed Dr Widdowfield, Head of Higher Education and Learner support. Dr Widdowfield explained that Scottish Government were currently engaging with stakeholders on their propositions for future research funding and welcomed the opportunity to present to SSAC and hear their views. She further noted that Dr Allan, Minister for Learning, Science and Scotland’s Languages and Mr Russell Cabinet Secretary for Education and Lifelong Learning would be happy to speak to SSAC member following the publication of the Scottish Government’s White Paper.

22. Dr Widdowfield highlighted Scotland’s world class research base and noted that there were many opportunities going forward. She noted that Scottish Government was fully committed to research and collaboration.

23. Professor Calder thanked Dr Widdowfield for her presentation and noted that SSAC would very much welcome the opportunity to meet with Dr Allan and Mr Russell following the publication of the White Paper.

**6. Big Data**

24. Professor Calder introduced a potential new work stream to SSAC on the implications of Big Data. She explained that there was huge potential around Big Data and while this was being driven by technological innovation outside Scotland there were huge opportunities for Scotland especially when considering our biomedical data. Professor Calder noted that there were a large number of initiatives currently going on and suggested that SSAC undertake a review in order to highlight the expertise in Scotland and outline all the current and likely initiatives, the unique and best aspects of these activities and identify any gaps and overlaps. She suggested that Professor Oberlander lead the initial review. SSAC members agreed the new work stream and that Professor Oberlander would produce an initial draft paper for the December SSAC meeting.

25. Professor Heathwaite suggested that SSAC engage with the CAMERAS network on this issue.

**7. Self-Assessment Exercise**

26. Dr Masters reminded colleagues that at the June SSAC meeting Council agreed that it would, in line with good governance practice, undertake a self-assessment exercise to help bring benefit to the Council performance. Since the June meeting a questionnaire was designed to identify the strengths and weaknesses within the Council meeting process in order to facilitate changes and improvements where necessary. All members of Council were invited to complete the questionnaire and a number of ex members were also approached for their views. In total fourteen responses were received. Dr Masters reported that overall the responses received were positive. A number of issues were raised these included:

* **Membership** - members commented that there was not enough representation from industry and that we were notability light on social science expertise, which is of increasing relevance in contentious areas of STEM. Several members further noted that they felt “underused” and there was a sense that member’s skills and capabilities could be better utilised. Comments were also made on the Council induction process and it was noted in several instance that this was “lightweight”.
* **Location of meetings** - members commented that they would like to see at least some meetings held in the Science community around Scotland. It was suggested that this would help maintain and raise SSAC’s profile within the science community and inform Council thinking.
* **Work Programme** – members felt SSAC needs more guidance about the issues that Government is interested in. It was also suggested that SSAC could undertake more horizon scanning activity and that more clarity in defining long-term objectives might be beneficial.
* **Relationship with Government** - The majority of members concerns were focused on SSAC’s relationship and interaction with Ministers and Scottish Government.

27. Dr Masters thanked members for their contribution and led a short discussion on the issues raised.

**8. SSAC Minutes 12 June 2013**

28. The SSAC agreed and approved the minutes of the last SSAC meeting held on the 12 June 2013.

**Matters Arising**

**SSAC Innovation report: Making the Most of our Scientific**

29. Professor Calder updated Council on Scottish Government’s recent response to the SSAC innovation report. She reported that meeting is currently being organised for the SSAC Co-Chairs and Mr Swinney, Cabinet Secretary for Finance, Employment and Sustainable Growth to discuss the report.

**9. Media Update**

30. Dr Masters introduced this item. No media items were reported.

**10. Chair/Member update**

31. Members updated colleagues on topics of interest from their areas.

**11. Date of the Next Meeting**

32. The next SSAC dinner and meeting would be held on 3-4 December at the National Museum of Scotland in Edinburgh. Full details will be provided in due course.

SSAC Secretariat

September 2013