

# STFC Science Board highlights

Jenny Thomas, UCL

# Science Board Membership

- Jenny Thomas (UCL, Chair)
- Tony Ryan (Sheffield University, Dep. Chair)
- Monica Grady (Open University)
- Gabe Aeppeli (UCL/IC)
- John Ellis (CERN)
- Matt Griffin (Cardiff University)
- Neville Greaves (Aberystwyth)
- Neville Harnew (Oxford)
- Tim Wess (Cardiff University)

# News and programme

- Usually meet once every 2 months
- Informing ourselves about the entire scientific programme but also the broad horizon of government objectives and where we fit with them
- We have to wrestle with balance of funding between facilities and grant funding
- Every area is being squeezed and there could be worse to come
- This year, the exchange rate has drowned out any other issue: no-one could have foreseen it and DIUS is looking to all the RCs to balance the books
- We are the big spenders of foreign money

# Last year's programme

- We heard about challenges in Environment, Energy, Security and Health
- We have discussed ways in which STFC can contribute to these grand challenges
- With accelerator technology we stand to cut across all areas
- With detector technology we can also contribute to all areas

# STFC Facilities

- We are now responsible for funding
  - Diamond (86%)
  - ILL (~33%)
  - ESRF (~15%)
  - Gemini (20%)
  - CERN (17%)
  - ESA (17%)
  - ESO (20%)
  - ING/JCMT/UKIRT (25/50/100%)
- And also almost solely responsible for running
  - ISIS (90%)
  - CLF (Central Laser Facility, 100%)

# Routes towards solutions (STFC)

- STFC facilities support Chemistry, Physics, Biology and Engineering – large scale and small scale
  - Making more complex materials – advanced methods for synthesis and fabrication
  - Detecting and treating/processing increasingly small amounts of material
  - Characterising materials – structure over many length scales, dynamics
  - Understanding materials – modelling and simulation of more complex systems, again over multiple length scales
  - Watching materials in action to understand function, over increasingly relevant (short?) timescales

# Some challenges related to STFC facilities

- Energy
  - Fusion (Hiper)
  - Hydrogen storage- The Hydrogen Economy
  - Solar Energy/Solar Cells
  - Bioenergy (& bio-inspired materials) – Learning from Life. Artificial cells, Photosynthesis
  - Renewable Energy - Rechargeable batteries, Fuel cells
- Environment
  - Energy-efficient or Waste-free Industrial Processes – Catalysis
  - CO2 sequestration
- Medical
  - Drug and vaccine design

# SB Vision for Accelerator Science

- SB has highlighted a number of areas where STFC could be more than the sum of its parts
- The first one to gain momentum is the accelerator area
  - SB helping to put together a National Accelerator Strategy
  - Some initial ideas will be no surprise to many



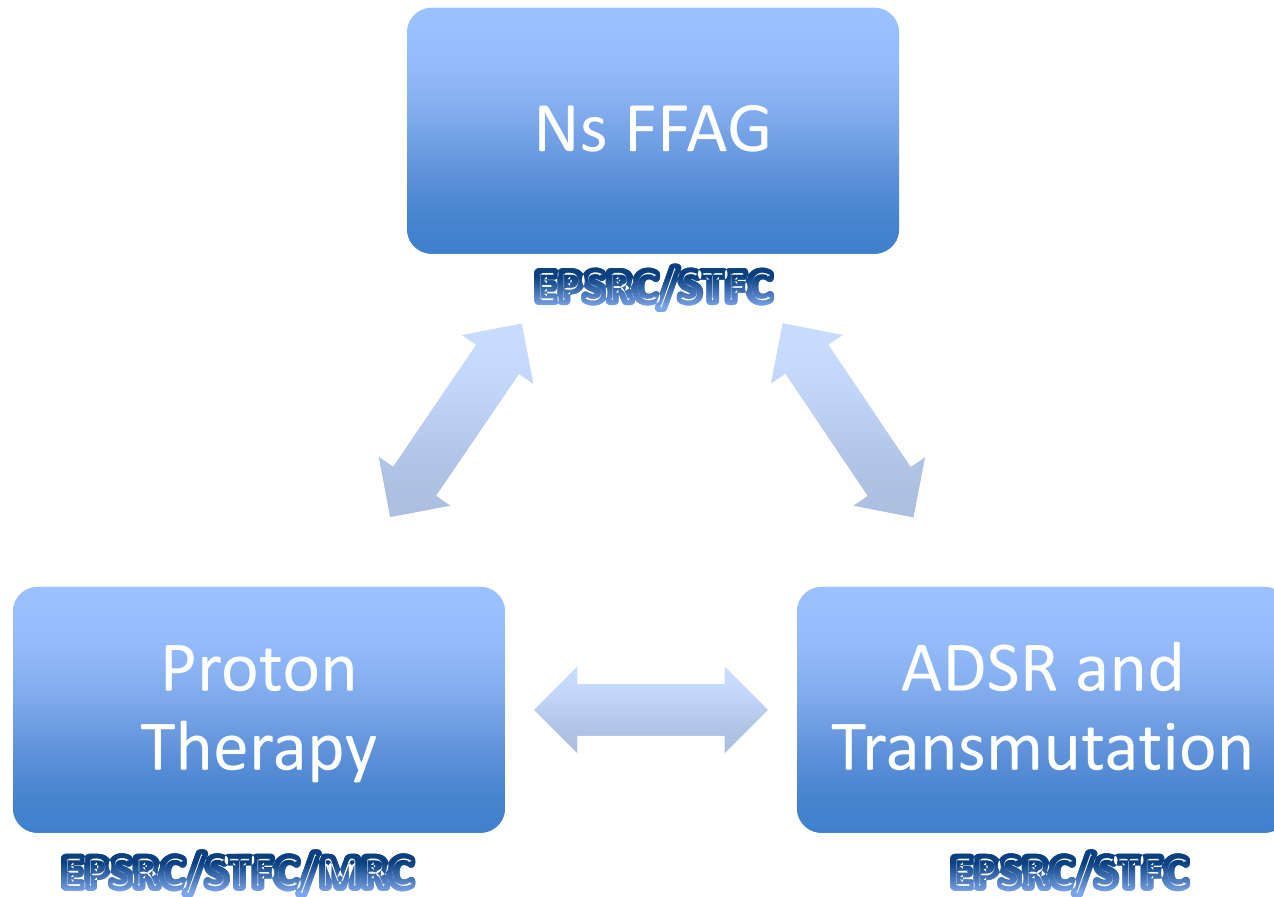
*Possible model* for the  
National Accelerator Strategy  
Three prong approach

Scientific tools  
(RAL)

Accelerator  
Applications  
(DL)

Innovative  
Accelerator  
R&D (Scotland)

# Accelerator Applications (DL)



# Global Picture

- SB membership brings together many different disciplines and is getting a very new picture because of this
- Clear that several different RCs are interested in this work
- SB is talking to MRC and EPSRC about a shared big picture approach
- Presently FFAGs sit at the center of this for the Accelerator Applications

# FFAGs

- These are interesting because they are small and cheap (on the accelerator scale at least)
- nsFFAGs are possibly the Next Big Thing and UK potentially could lead this
- Could revolutionize the whole area of accelerator applications (low energy, low-high intensity)
- UK industry in a good position to benefit from this development (made the magnets for EMMA)
- success oriented blitz funded by combination of MRC/EPSRC/STFC could pull this off in 2-3 years

# Innovative Accelerator Technology

- Scottish Universities (EPSRC/SUPA funded) have made big progress with Wakefield Acceleration (together with consortium from UK)
- New investment here could lead to a step change in electron acceleration techniques
  - Synchrotron radiation, X-FEL, Gamma-FEL
- Longer term could dream of high energy machine for PP

# Where now?

- Reasonably modest, targeted and collaborative investment in accelerator development could help PP weather the present political and economic storm and prepare for a possibly different future
- Building on previous investment from PPARC and CCLRC, its time to join up the dots on this area of technology within the UK
- Proposal is in the writing and Accelerator Vision meeting will be held on 2<sup>nd</sup> June (Venue TBD)

# STFC-KE

- Just a word about KE developments
  - CLASP !!!! Challenge Led Applied Systems Program
- Call should be announced in a month or so
  - Last pilot scheme (PNPAS) finally finished
  - 37 very innovative proposals received
  - 5-8 funded this time around
  - Issues with IP solved
  - Idea is to
    - get identifiable income stream into STFC
    - Keep track of STFC's contribution to UK PLC
- Would like to see KE become a more serious integral part of science grants where appropriate
  - Works both ways:
    - serious about doing it, serious about funding it!

# Conclusion

- SB getting to grips with a very broad remit
- Joining up not only inter-STFC but intra-RCUK
- Government objectives cannot be ignored
  - Potential source of new money if Obama-style stimulus package occurs
- *Next Government's* objectives cannot be ignored !!!
  - The sooner we face up to the potential catastrophe, the sooner we can avert it
- It is possible that science funding has changed for the foreseeable future, not just the short term
- We have PhDs, lets be smart...