

A wireframe model of a particle accelerator ring, showing the complex structure of the ring and the various components involved in the acceleration process. The ring is depicted in a perspective view, highlighting its three-dimensional nature.

# **FAIR**

# **Facility for Antiproton and Ion Research**

**UK participation**

Daresbury Laboratory, October 2006

Action from Bilateral discussions 9/8/6:

UK-FAIR meeting to discuss contribution

H.Gutbrod (GSI)

D.Kraemer (GSI)

I.Augustin (GSI)

P.J.Nolan (Liverpool, HOG's)

G. Rosner (Glasgow, STI, Panda)

J.Simpson (CCLRC, STI)

W.Gelletly (Surrey, Nustar)

T.Bradshaw (CCLRC, targets etc.)

C.Densham (CCLRC, targets etc.)

N.Pratt (CCLRC, AFI)



## Proposed agenda:

Introductory talks/discussion

FAIR status

Nustar (WG)

Panda (GR)

Beam dumps and targets (CD)

Materials irradiation(TB)

UK funding status (PJN)

UK involvement summary (JS)

....discussion....

16:00 Taxi



## UK FAIR Community Meeting 25-26 January

Sub-Group to represent the community

Collate information

Discussion with EPSRC and CCLRC

P.J. Nolan

M. Freer

G. Rosner

J. Simpson





## UK Participation:

Numbers discussed with EPSRC March 2006.

## Topics:

- Experiments (NUSTAR and PANDA)
- Accelerator technology (CCLRC)
- Microelectronics (CCLRC)
- Accelerator science (CCLRC and Cockcroft)

## UK Participation: Experiments (NUSTAR and PANDA)

Construction phase (6-7 years)

NUSTAR

R3B/EXL

HISPEC/DESPEC

LASPEC

ILIMA

PANDA

Theory

EPSRC FEC grant application

Capital, PDRA, Engineering/technical, travel, FEC

## UK Participation: Experiments

### NUSTAR (6-7 years)

(Birmingham, Brighton, CCLRC, Edinburgh, Liverpool, Manchester, Paisley, Surrey, York)

Capital	£6.1M
Engineer/technical	£6.1M (approx 12FTE/year)
Travel	£1.0M
PDRA	£7.6M (approx 15.5 FTE/year)
FEC (academic staff)	£3.7M
<b>Total</b>	<b>£24.5M (approx £3.5M/year)</b>



## UK Participation: Experiments

PANDA (7 years)  
(Edinburgh, Glasgow)

Capital	£3.2M
Engineer/technical	£1.7M
Travel	£0.3M
PDRA	£2.5M
FEC	£1.4M
Total	£9.1M (approx £1.3M/year)

Theory  
(Manchester, Surrey)

£0.5M/year

Support from most of the programme (R3B/EXL)



UK Participation: Commitment so far

NUSTAR

DESPEC-AIDA (Si implantation system)

Edinburgh, CCLRC, Liverpool £2.35M 4 years

Total capital £0.54M

PANDA

Existing grant (Glasgow), £0.36M

Cost book?

MoU

Count as a contribution?

## UK Participation: Accelerator technology (CCLRC)

High intensity target and beam dumps  
Radiation harness, material testing and irradiation

Commitment so far:  
£170k (05-07)

Cost book?  
Count as a contribution?

Estimate 15 FTE 5-year programme 07/11  
Cost £3.2M (£2.2M staff, £1M capital)



## Rutherford Appleton Laboratory – preliminary list of joined activities

### Radiation sensitivity and fatigue of insulating materials for superconducting magnets:

- Gebhard Moritz, GSI Magnet Group Head, [G.Moritz@gsi.de](mailto:G.Moritz@gsi.de)
- Gertrud Walter, GSI Magnet Group, [g.walter@gsi.de](mailto:g.walter@gsi.de)
- Christina Trautmann, GSI Materials Science, [ch.trautmann@gsi.de](mailto:ch.trautmann@gsi.de)
- Daniel Severin, University of Marburg, [severin@chemie.uni-marburg.de](mailto:severin@chemie.uni-marburg.de) (PHD student)
- Prof. Wolfgang Ensinger, University of Marburg, [ensinger@chemie.uni-marburg.de](mailto:ensinger@chemie.uni-marburg.de)
- Justin Greenhalgh, Rutherford Lab., [Justin.Greenhalgh@rl.ac.uk](mailto:Justin.Greenhalgh@rl.ac.uk)

### 3D Vector Fields calculations

- Gebhard Moritz, GSI Magnet Group Head, [G.Moritz@gsi.de](mailto:G.Moritz@gsi.de)
- Carsten Mühle, GSI Magnet Group, [c.muehle@gsi.de](mailto:c.muehle@gsi.de)
- Egbert Fischer, GSI Magnet Group, [e.fischer@gsi.de](mailto:e.fischer@gsi.de)
- J.H. Rochford, Rutherford Lab., [J.H.Rochford@rl.ac.uk](mailto:J.H.Rochford@rl.ac.uk)

### Collector Ring (CR) cryostat design

- Gebhard Moritz, GSI Magnet Group Head, [G.Moritz@gsi.de](mailto:G.Moritz@gsi.de)
- Yu Xiang, GSI Magnet Group, [y.xiang@gsi.de](mailto:y.xiang@gsi.de)
- Marion Kauschke, GSI Magnet Group, [m.kauschke@gsi.de](mailto:m.kauschke@gsi.de)
- Tom Bradshaw, Rutherford Lab., [Tom.Bradshaw@rl.ac.uk](mailto:Tom.Bradshaw@rl.ac.uk)

### Cryogenics (review)

- Gebhard Moritz, GSI Magnet Group Head, [G.Moritz@gsi.de](mailto:G.Moritz@gsi.de)
- Yu Xiang, GSI Magnet Group, [y.xiang@gsi.de](mailto:y.xiang@gsi.de)
- Marion Kauschke, GSI Magnet Group, [m.kauschke@gsi.de](mailto:m.kauschke@gsi.de)
- Tom Bradshaw, Rutherford Lab., [Tom.Bradshaw@rl.ac.uk](mailto:Tom.Bradshaw@rl.ac.uk)

### Targets for Super Fragment Separator (SFRS) and Antiproton-Production

- Martin Winkler, GSI Nuclear Physics II, [m.winkler@gsi.de](mailto:m.winkler@gsi.de)
- Klaus Sümmerer, GSI Nuclear Physics II, [k.suemmerer@gsi.de](mailto:k.suemmerer@gsi.de)
- Bernhard Franzke, GSI Accelerator division, [B.Franzke@gsi.de](mailto:B.Franzke@gsi.de)
- C. Densham, Rutherford Lab., [C.Densham@rl.ac.uk](mailto:C.Densham@rl.ac.uk)

### AC losses in SIS200/300 magnets

- Gebhard Moritz, GSI Magnet Group Head, [G.Moritz@gsi.de](mailto:G.Moritz@gsi.de)
- Juris Kaugerts, GSI Magnet Group, [j.kaugerts@gsi.de](mailto:j.kaugerts@gsi.de)
- D.E. Baynham, Rutherford Lab., [D.E.Baynham@rl.ac.uk](mailto:D.E.Baynham@rl.ac.uk)

### Beam dumps and beam shutters, collimators

- C. Densham, Rutherford Lab., [C.Densham@rl.ac.uk](mailto:C.Densham@rl.ac.uk)
- Hans Gutbrod, GSI Project Coordinator, [H.Gutbrod@gsi.de](mailto:H.Gutbrod@gsi.de)

**UK Participation: Microelectronics (CCLRC)**

**ASIC's for experimental programme**

**3 FTE/year (part of community bids)**

**UK Participation:**

**Accelerator science (CCLRC and Cockcroft)**

**PDRA's in ASTEC and/or Cockcroft**