

The Cockcroft Institute

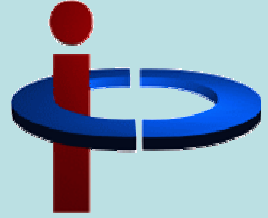
for Accelerator Science and Technology

Lancaster University
The University of Liverpool
The University of Manchester
CCLRC ASTeC
NWDA
PPARC

[John Dainton](#)

1st Cockcroft Workshop (July 20th 2004) and
Faraday Partnership Accelerator Club (July 21st 2004)
Daresbury Laboratory

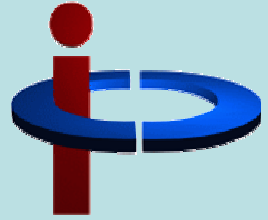




PPARC Strategic Objectives

- enhanced international standing
- major share in construction of next linear collider (5 years)
- possibility of UK hosting a major global facility (10 years)
- multi-TeV particle physics
- UK industry

Accelerator Science and Technology

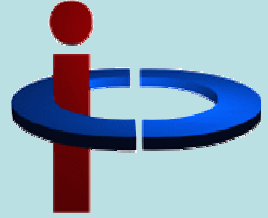


CCLRC Strategic Objectives

- enhanced international standing
- major share in construction of next linear collider (5 years)
- possibility of UK hosting a major global facility (10 years)
- multi-TeV particle physics
- synergy with UK facilities
 - ISIS
 - SRS
 - DIAMOND
 - 4GLS
- UK industry

macro-molecular condensed matter physics
organic systems
materials engineering
electronics
biotech
medical

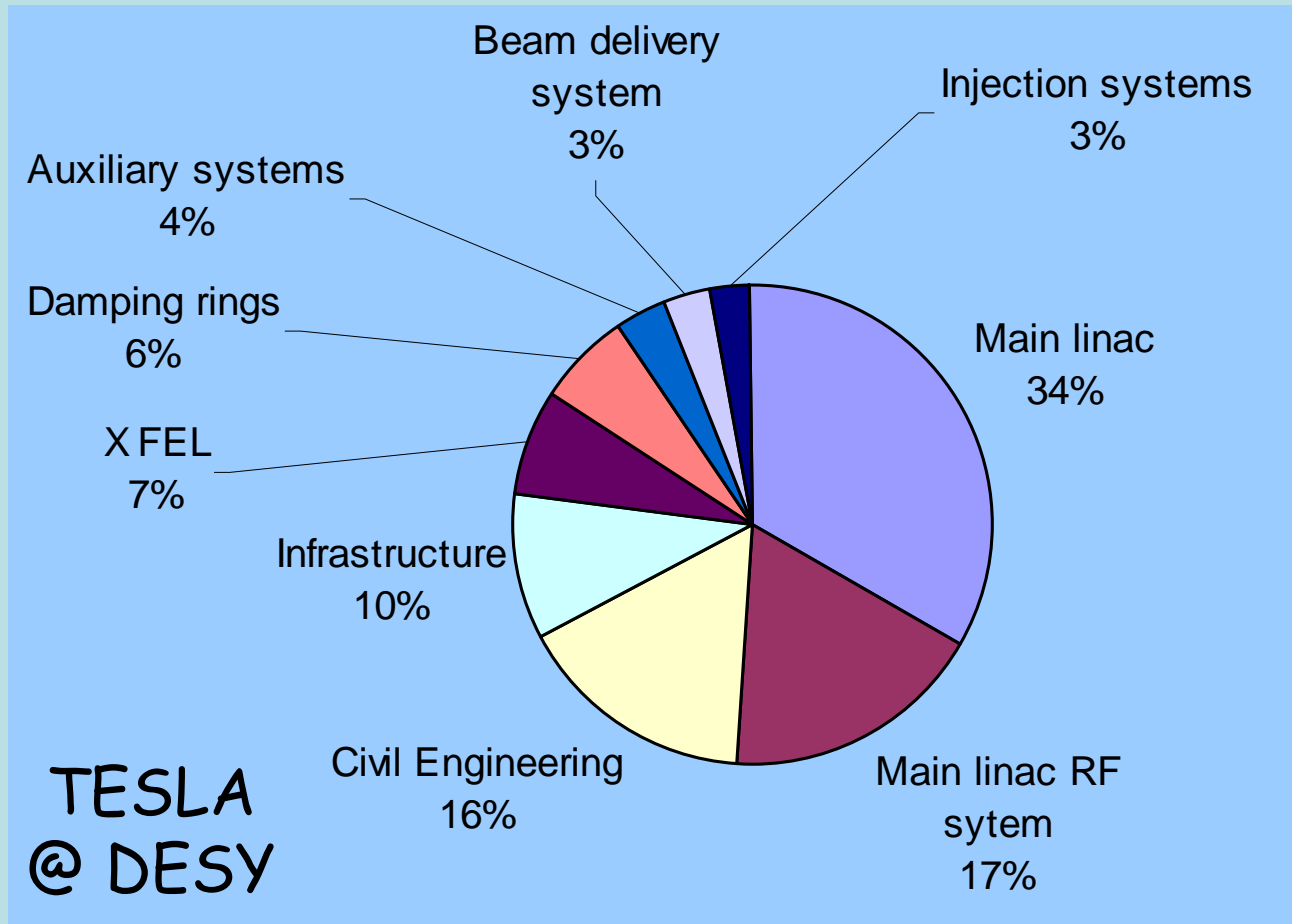
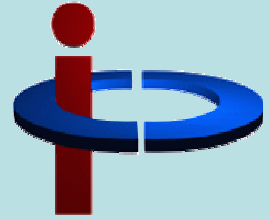
Accelerator Science and Technology



Cockcroft Institute Strategic Objectives

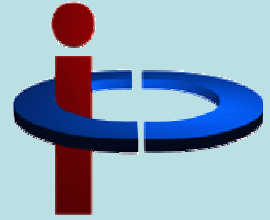
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- UK industry
- UK higher education

Typical Cost Breakdown



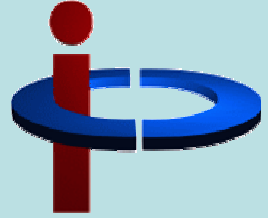
50% of cost in the main Linac and the RF system

Current UK Strengths



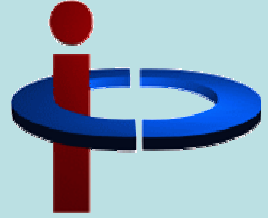
- ASTeC
 - Accelerator physics, **RF engineering**, magnets and insertion devices, cryogenics, vacuum science
- Lancaster University
 - **RF engineering**, microwave tubes
 - experimental Particle Physics
 - mathematical technology
- Liverpool and Manchester Universities
 - experimental and theoretical Particle Physics, Nuclear Physics, 4GLS physics
- industry
 - **microwave tubes, high power RF components**, beam line components, software control and monitoring
- government (DTI + OST + DA)
 - Faraday Partnership in **High Power RF Engineering**
 - RC industrial initiatives

Current UK Weaknesses



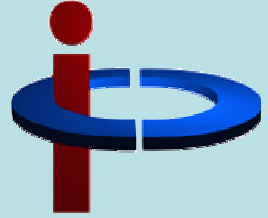
- shortage of experienced staff
- below critical mass
- industry
 - fragmented
 - cannot risk speculative development of accelerator components
- lack of facilities for large-scale experiments and prototyping

Centre of Excellence Requirements



- 100+ staff
- full scale beam and high power RF laboratories
- expertise in
 - accelerator physics
 - RF Engineering
 - magnets and insertion devices
 - cryogenics
 - vacuum science
- industrial involvement

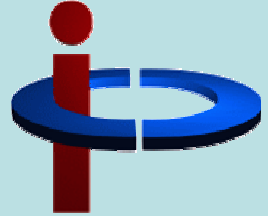
Building the Centre of Excellence



to achieve the objectives in the timescale:

- build on existing strengths
- a single national focus
- sufficient financial support
- clear route for industrial involvement

The Cockcroft Institute



NW Universities

- 14 academic staff
- 30 PPARC funded research staff
- 6 support staff
- PhD students
- industrial and academic visitors

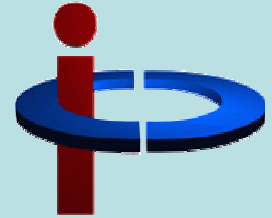


ASTeC

- 50 scientists and engineers

Institute building at Daresbury Lab

- offices and meeting rooms
- high power laboratories

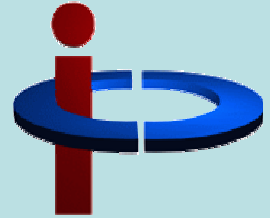


Communications

- M6 and M62
- West Coast Main Line
- Manchester International Airport
- Liverpool John Lennon Airport



Investments



- NW Universities
 - 12 new academic posts



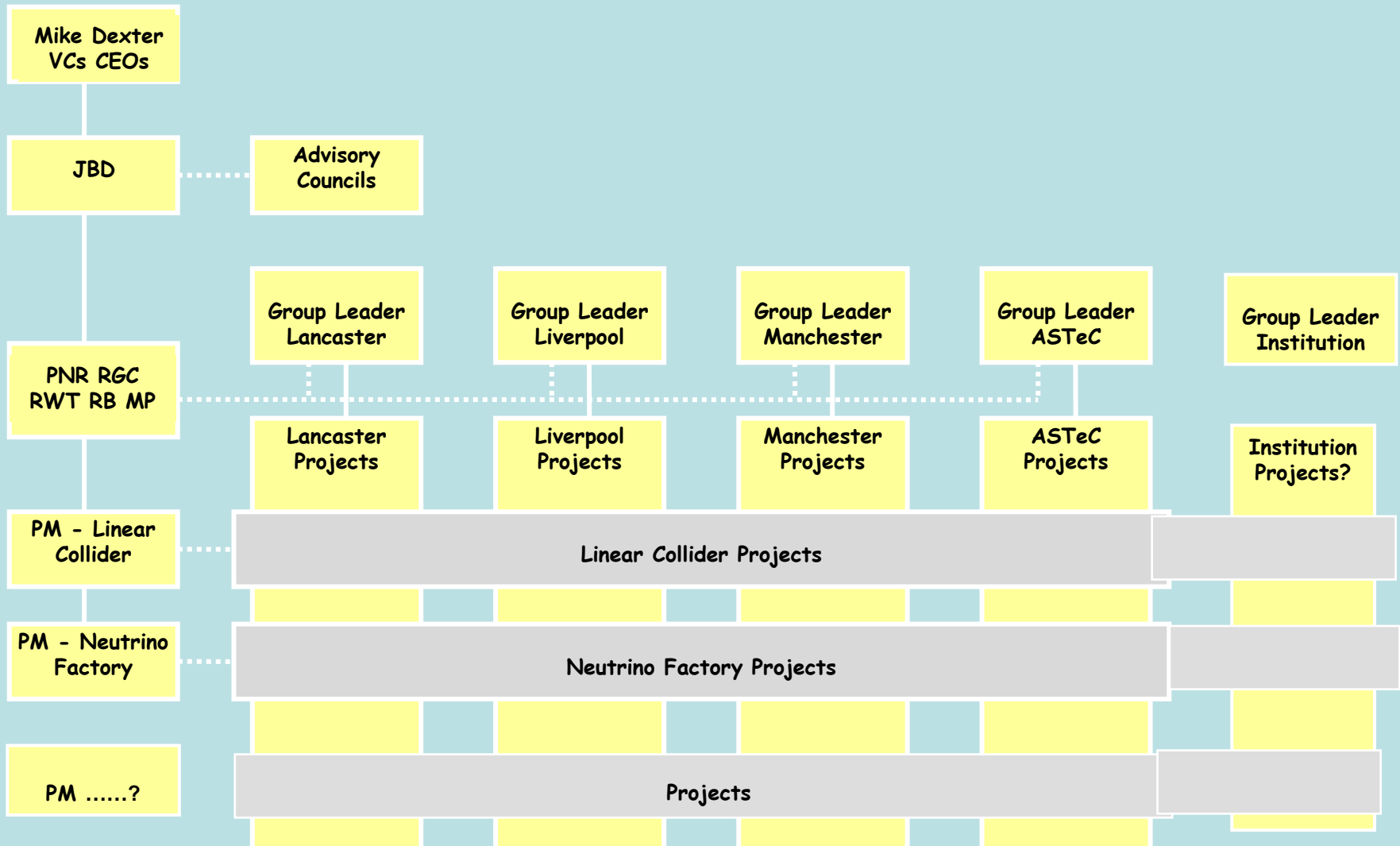
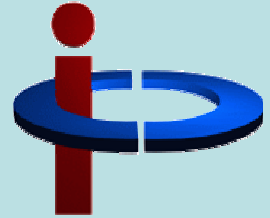
- CCLRC
 - 2 posts
 - ASTeC staff



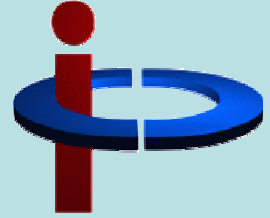
- NWDA
 - £10M Institute building



Management Structure

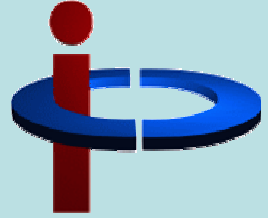


Institute Management



- Institute Board
 - chair with senior industrial and academic experience
 - senior HEI and CCLRC representatives
- Director
 - accelerator scientist of international distinction
- International Advisory Councils
 - scientific and industrial
- ~~Integration and Governance~~ **Integration and Governance Committee**
 - HEI and CCLRC Group Leaders, Programme Managers
 - RGC (industry + education) MP (education + strategy) RB
PNR (secretary + meetings) RWT(education+strategy)

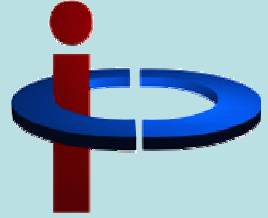
Deliverables



- generic R&D
- project specific R&D
 - Linear collider
 - Neutrino factory
- leadership of national contributions to international facilities
- technology transfer to industry
- staff of international quality
- seamless involvement of HEIs and CCLRC
- education and training

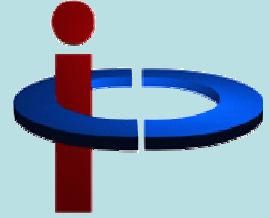
 research strategy group (RWT+.....)

International Links



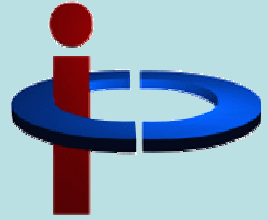
- existing links
 - CERN, DESY, Fermilab, JLab, SLAC
- distinguished Visitor Programme
- Fellowships
- staff exchanges
- conferences and workshops
- schools
- studentships

Industrial Links



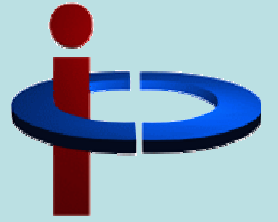
- existing links
 - E2v technologies, TMD Technologies, Elekta, Oxford Danfysik, Alan Dick
- collaborative R&D
- promote new industrial capability
- staff secondment
- trained staff move to industry

Status: July 20th 2004



- advertising first (project) positions
- seeking DTI approval for building refurbishment with NWDA
- Director search in progress
- preparing research strategy
 - request IB for appointment of first academic staff
 - request IB for appointment of first core research staff
 - prepare project bids
- preparing education and training
- preparing industrial contact

 Cockcroft born still to crawl !



The Cockcroft Institute

for Accelerator Science and Technology

<http://www.lancs.ac.uk/cockcroft-institute/>

Our national centre of excellence in a global network for the foreseeable future, building on our strengths and experience developed over decades.

