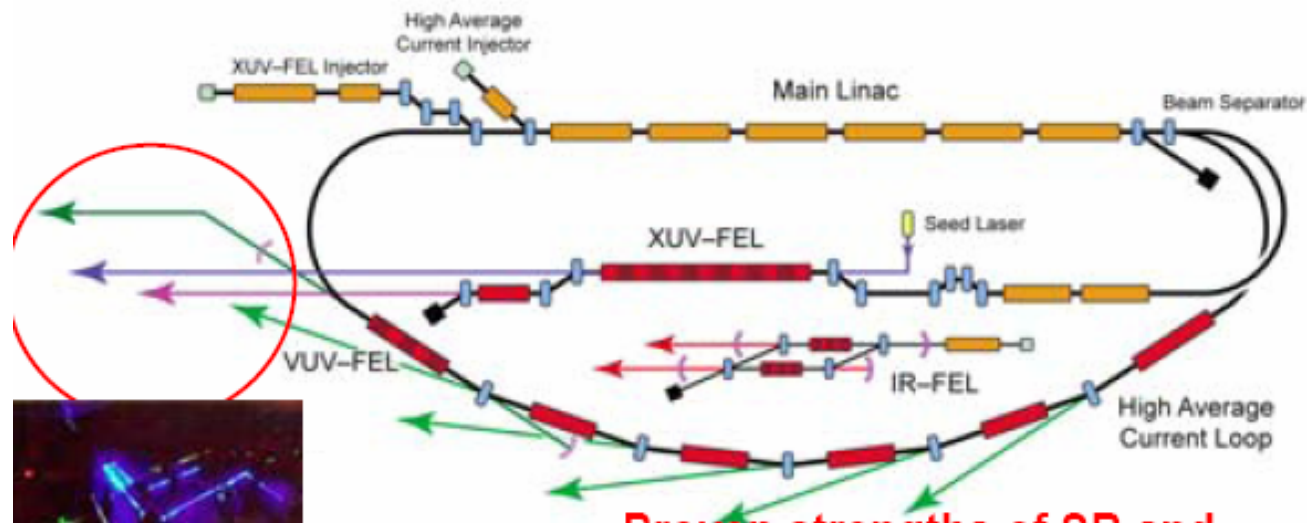


EUROFEL Annual Meeting 2006 in Daresbury

- EUROFEL is a coordinated, joint effort to prepare the construction of the next-generation free-electron laser (FEL) light sources proposed in Europe.
- Six work packages:
 - DS1: Photo-Guns and Injectors
 - DS2: beam dynamics simulations
 - DS3: Synchronisation
 - DS4: seeding and harmonic generation
 - DS5: CW linac based light sources
 - DS6: design and assembly procedures for superconducting accelerator modules (cryo-modules) & Cryo-Module Test Bench (CMTB)

4GLS

FEL – XUV/VUV/IR
Spontaneous SR undulator/THz
Table-top lasers



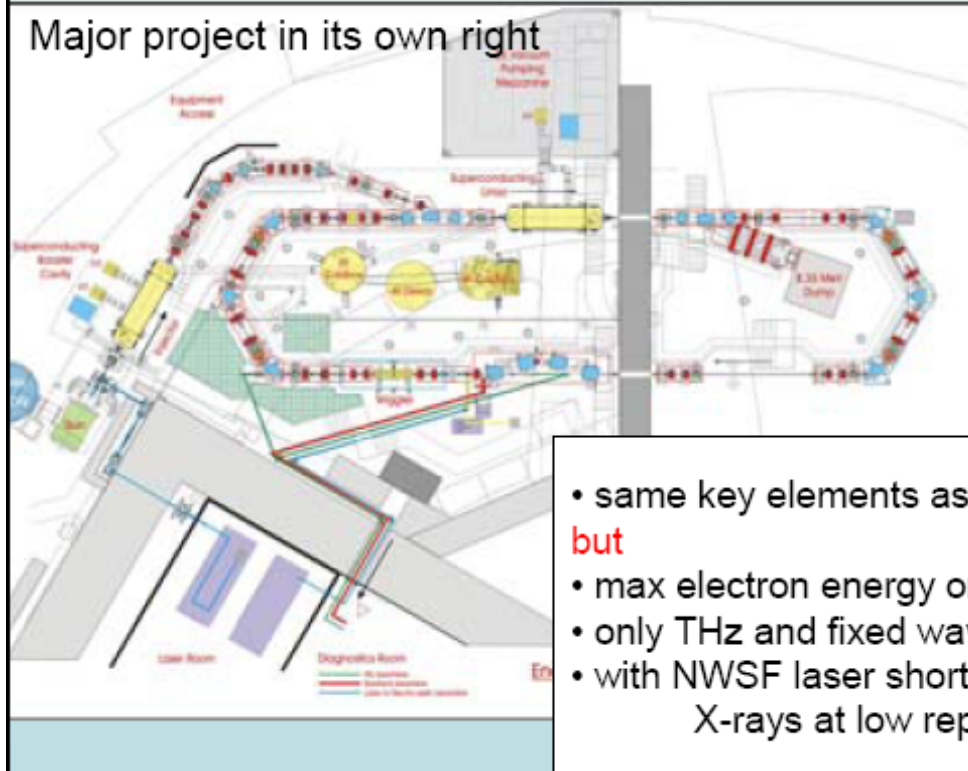
plus
laser sources

- Proven strengths of SR and conventional lasers
- Unique characteristics of FELs
- Huge potential of combined sources

ERL Prototype

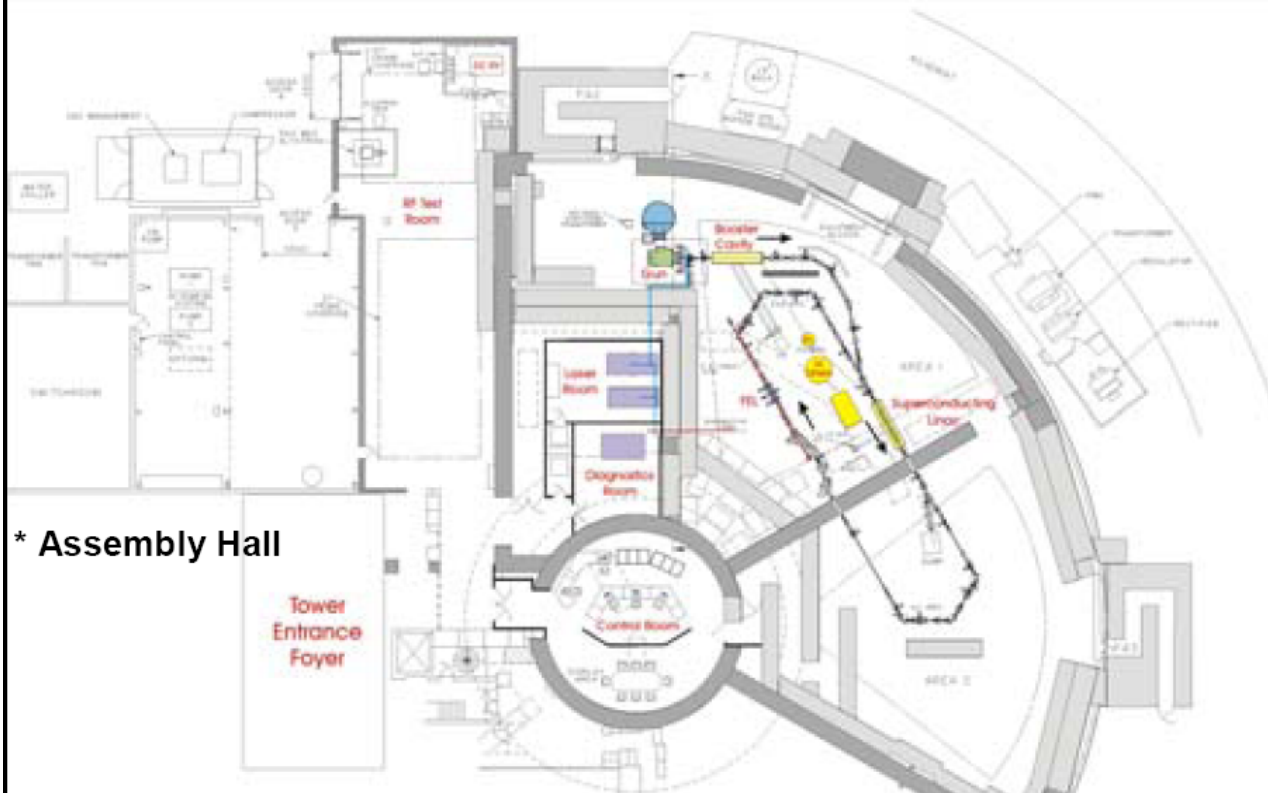


Major project in its own right



- same key elements as 4GLS
- **but**
- max electron energy only 35MeV
- only THz and fixed wavelength ir
- with NWSF laser short pulses of X-rays at low rep rate

ERLP: Accelerator Hall



* Assembly Hall

ERLP: where we are now



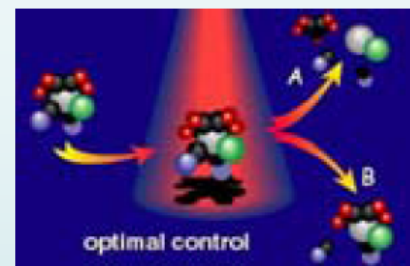
- Electrons from photoinjector
- Linac module down to 2K
- Booster module vacuum tested
- BTS assembly progressing





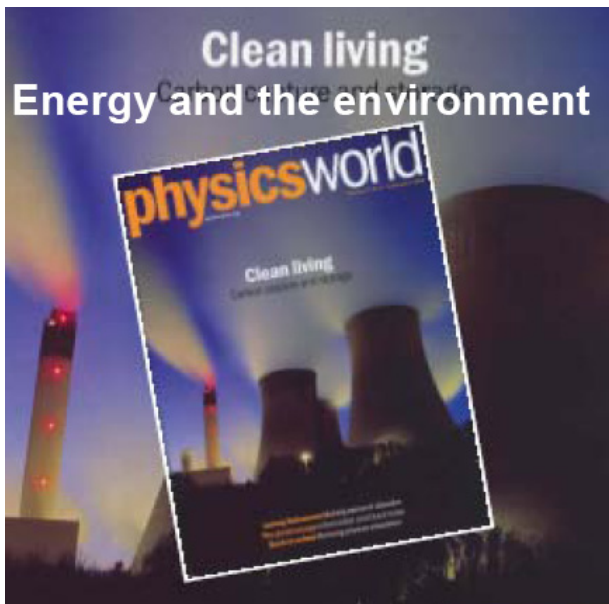
Key impact areas

- Understanding catalytic reaction pathways
- Understanding atomic and molecular dynamics



- Understanding charge and spin dynamics - new nanodevices
- Understanding the function of biomolecules in living systems
- Nanoscale dynamic imaging

Clean living Energy and the environment



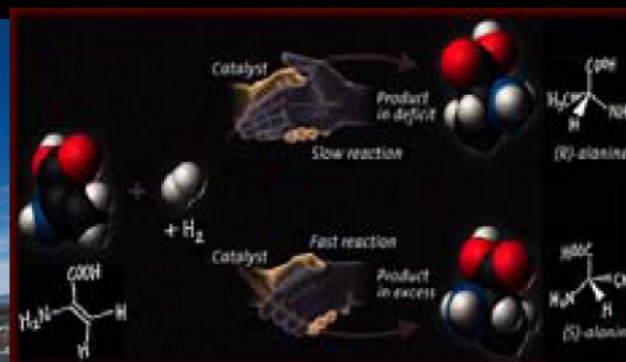
Cleaner catalysts by design

How do we design cleaner, more efficient catalysts?

Can we understand and optimise the synthesis of chiral pharmaceuticals?

How do we combust hydrocarbons more efficiently?

Can we understand the enzyme catalysis that gives clean biofuels?

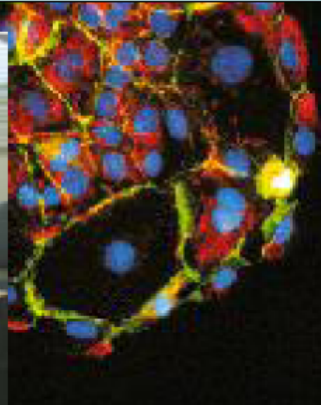


Human health

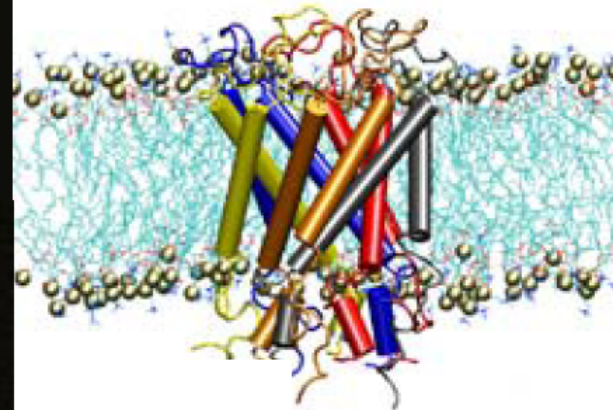
How do we diagnose disease (such as skin cancer) earlier and improve treatment?

How are cells damaged and repaired? How do cells signal in the extracellular matrix? What is the action of a drug?

How can we improve wound healing and bone repair?



Function of biomolecules - membrane proteins



Can we measure the mechanisms of energy, electron, proton and chemical transport at the cell membrane *in real time*?

How does energy transfer around a biomolecule and between a biomolecule and a substrate?

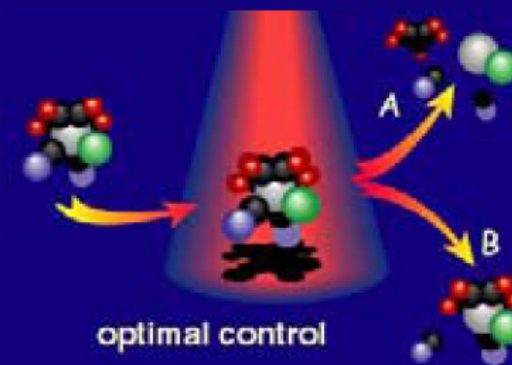
Fundamental research in uncharted territory.....

How do stars form and work?
How did life originate?

Can we understand electron correlation?

Is our understanding of quantum mechanics correct?

Can we **control** the direction of a chemical reaction?



The Science Need...



Require an ultra-high brightness *low energy* facility that allows the use of fast pulsed sources in combination

4GLS is being designed to meet this need

PLENARY TALKS
Merrison Lecture Theatre

13:00 – 13:10	Welcome by the organisers	
13:10 – 13:30	The 4GLS Project and the ERLP Demonstrator E. A. Seddon (Project Leader 4GLS)	
13:30 – 13:40	Opening of EUROFEL Workshop J. Feldhaus (Coordinator of EUROFEL)	
13:40 – 15:30	Highlights DS1-3 Recent Results with the SPARC Emittance Meter E. Chiadroni (INFN, DS 1) Improvement of beam quality in FERMI@elettra S. Di Mitri (ELETTRA, DS 2) Optical Clocks for FEL Facilities G. Hirst (CCRLC, DS 3) Phase Stability Measurements at the SPARC RF System A. Gallo (INFN, DS 3)	Chair: D. Holder
15:30 – 16:00	<i>Refreshment break</i>	
16:00 – 17:30	Highlights DS4-6 High Harmonic Laser Seeding at SPARC L. Gianessi (ENEA, DS 4) Implementing Self-Seeding at FLASH: Simulations and Prospects V. Miltchev (DESY, DS 4) Reduction of Microphonic Detuning in CW TESLA Cavities A. Neumann (BESSY, DS 5) Industrial Cryomodule Assembly Study Test Bench Status T. Schnauz (DESY, DS 6)	Chair: M. Poole

8:30 *Bus from hotel to Daresbury Laboratory*

9:00 – 12:45 **Individual Task Meetings** Cockcroft Institute

12:45 – 13:00 **Photo of EUROFEL Group** Cockcroft Institute, Atrium

13:00 – 15:00 **Lunch & Poster Session**
Cockcroft Institute Atrium and G08

PLENARY TALKS
Cockcroft Institute Seminar Rooms A & B

15:00 - 18:00 **Summary & Perspectives of each Task (DS1 - DS 6)** Chair: M.-E. Couprie
incl. results of the task meetings

Management Activities (DS 0) & Seventh Framework Programme
U. Krell (DESY, DS 0)

CLOSED MEETINGS
Cockcroft Institute Seminar Room C

9:00 – 10:30	General Assembly Meeting
10:30 – 11:00	<i>Refreshment break</i>
11:00 – 12:00	Project Steering Committee

- EUROFEL is in its 2nd year, one more to go
- Next 'Seventh Framework Programme' does not finance design studies, only facilities which are on the 'ESFRI Roadmap' are supported:
 - XFEL
 - Consortium FLASH, BESSY, FERMI, PSI

Not clear yet how to go...