



WELCOME LHCb

Theatre of Dreams: Beyond the LHCb Phase 1 Upgrade

6-7 April 2016

Professor Stephen Watts

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Some famous Manchester science academics



Ernest Rutherford



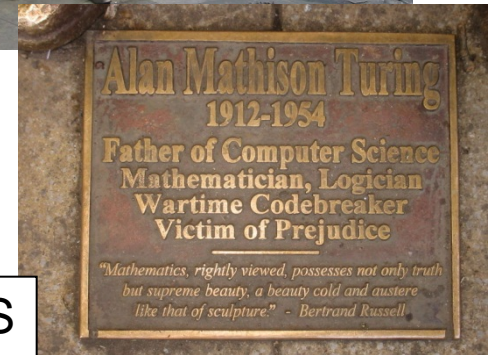
Tom Kilburn and Sir Freddie Williams and
'The Baby'



Sir Bernard Lovell



Dame Nancy Rothwell, FRS
Current President of UoM



Alan Turing was at Manchester from 1948 until his death in 1954.
Statute on Sackville Street Campus
JBCA staff based in Turing Building

PHYSICS AS AN INTELLECTUAL PURSUIT HAS EXISTED IN MANCHESTER FOR ~ 165 YEARS

Owens College – 1851

In 1851, one of only two institutions in the country to teach physics at UG level, irrespective of religious belief. The institution was open to all applicants for admission without respect to place of birth, and without distinction of rank or condition in society.

Prepare people for scientific and technical careers in local industry, and also **courses in sciences for local school teachers to better prepare pupils for entry to the college.**

Link to local industry – Manchester key city of Industrial revolution - motivated research.

Story of the Physics@UoM can be partly told through its Langworthy Professors

Chair endowed by E. R. Langworthy from 1870.

Balfour Stewart 1870 – 1887

Sun spots and meteorology. Proposed what is now called the ionosphere

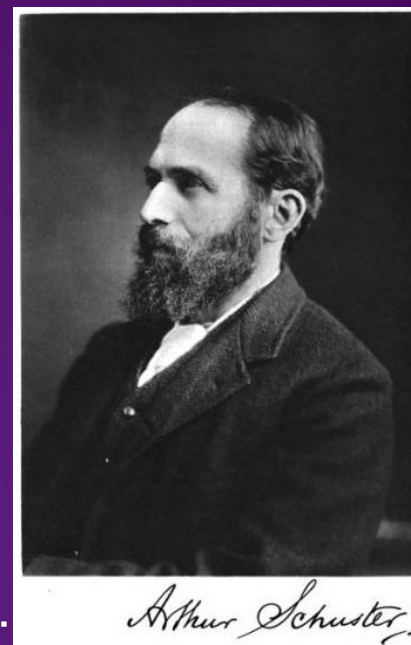
Inaugural lecture Oct 20th 1870



“Certain experiments, whether from the great time they require, or the great expense they demand, cannot be performed in a College; while routine and long-continued observations, such as those connected with the various branches of cosmical physics, are of such a nature as to require a *central establishment to superintend their organisation and reduction*. There is thus, I think, the necessity for a central establishment of some kind, devoted to that class of experiments and observations requiring great time, great space, and great expense for their completion.”

Stewart foresaw national and international labs ...

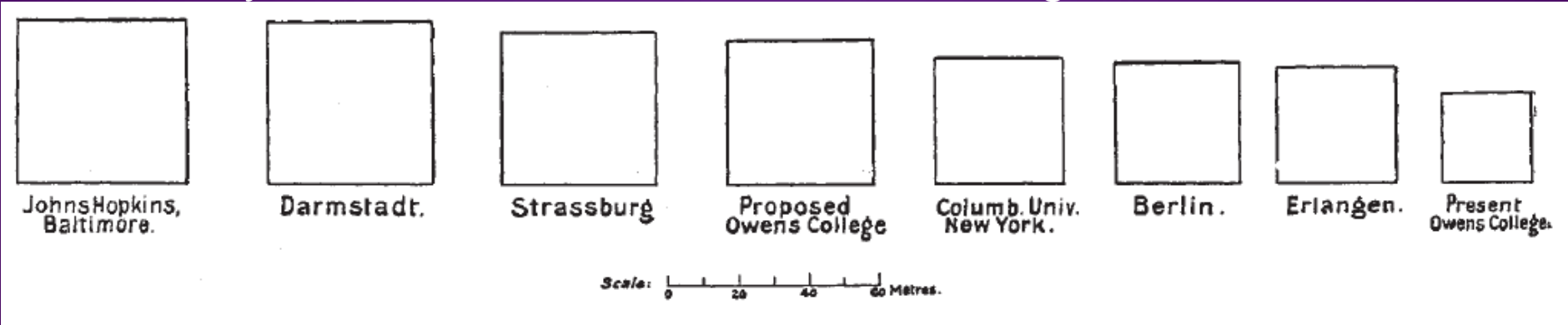
Schuster was determined to make the laboratories at Manchester significant !



Arthur Schuster 1887-1907

2nd Langworthy Professor - planning and £6 m investment

“The Physical Laboratories “ Owens College then VUM



Then Schuster made sure that Rutherford was appointed to succeed him
1967 New Physics and Astronomy Building named after Schuster

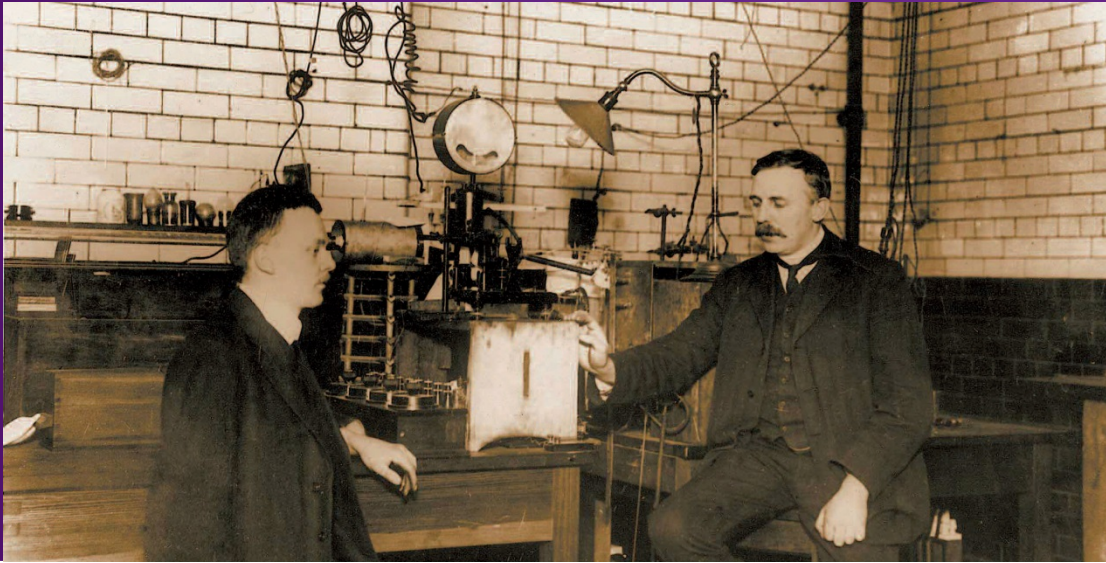
The original Schuster laboratory was in the University main building.

New building in 1967



Staff housed in Schuster Building + some in PSI + 3rd floor Turing + Jodrell Bank Observatory (30 miles away)

PHYSICS REVOLUTION AT START 20th CENTURY



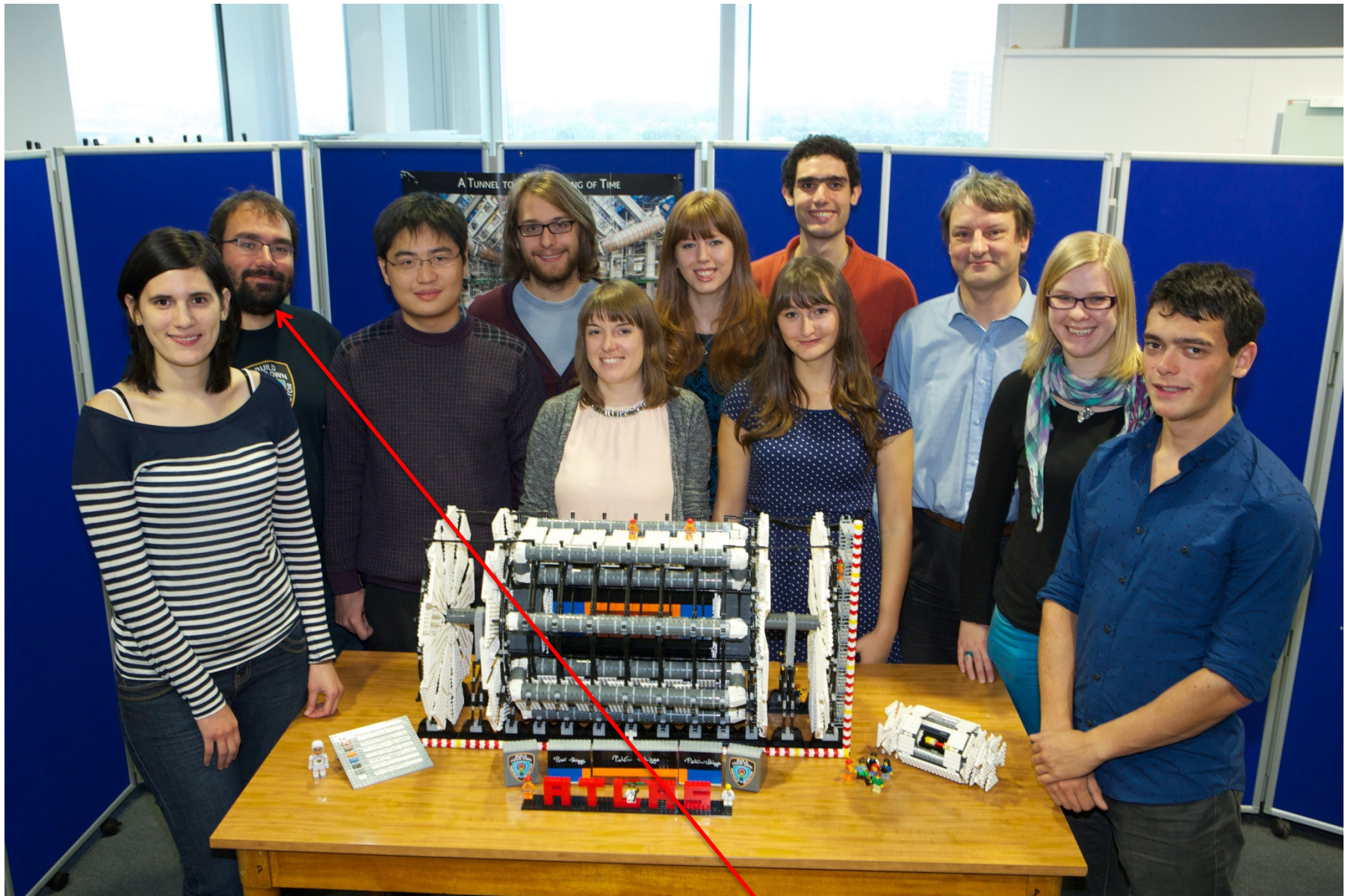
Niels Bohr – March-Sept 1912

Ernest Rutherford 1907 – 1919 3rd Langworthy Professor

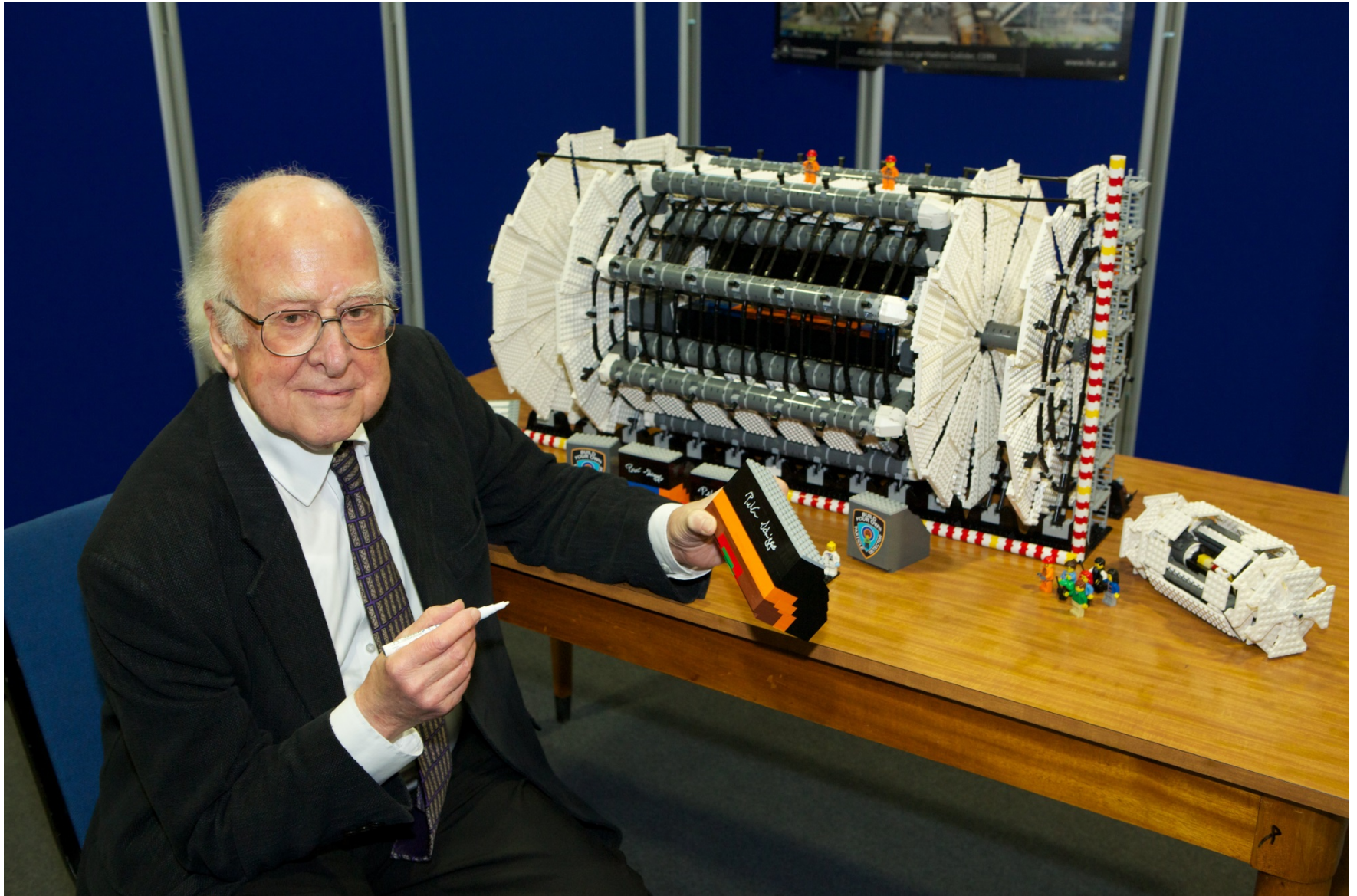
1911 Discovery of the nucleus – Rutherford Model of the Atom

1917 Splitting of the atom (transmutation) $^{14}\text{N} + \alpha \rightarrow ^{17}\text{O} + \text{proton}$

RUTHERFORD LECTURE THEATRE – NIELS BOHR COMMON ROOM



ATLAS LEGO Model – designed by Dr Sascha Mehlhase - Niels Bohr Institute, University of Copenhagen.



Peter Higgs putting the Higgs into ATLAS in the Niels Bohr Seminar Room – October 2013

YOU ARE MEETING IN THE BRAGG LECTURE THEATRE

William Lawrence Bragg Langworthy Chair 1919-1937

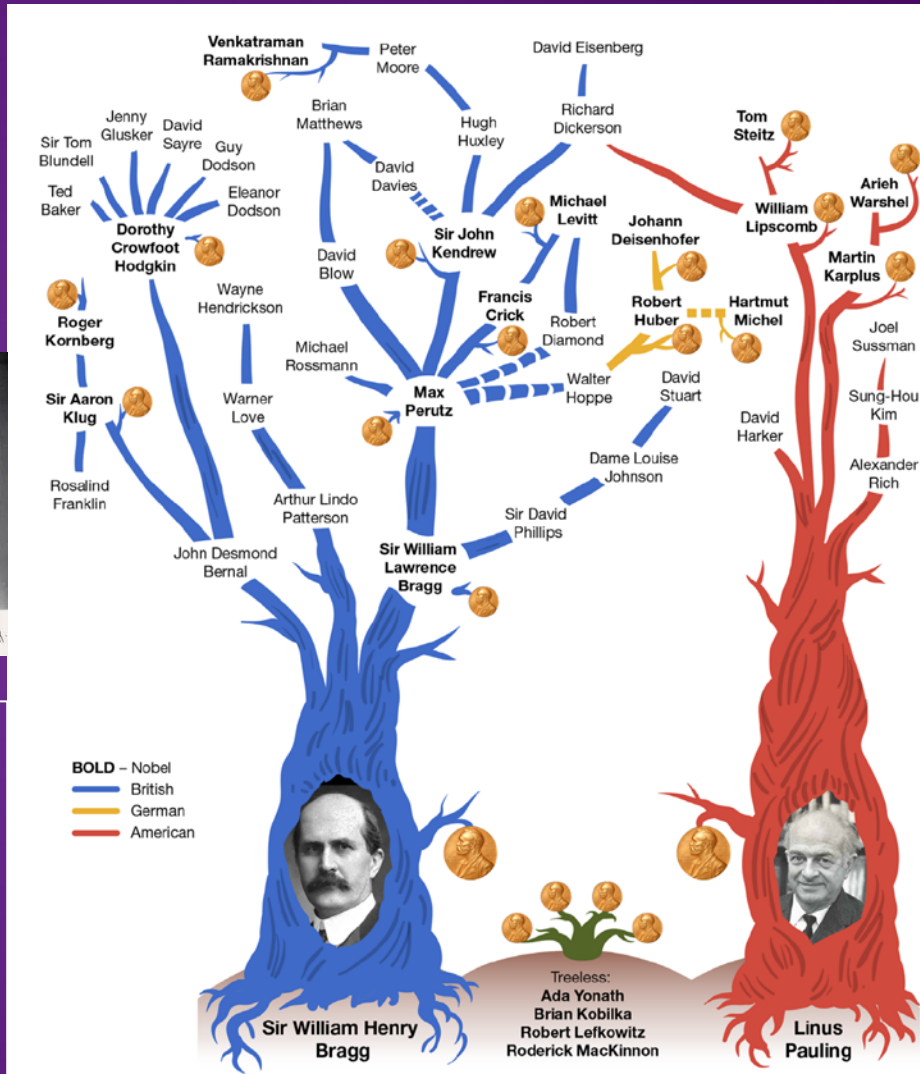


Fig. 1. A family tree of macromolecular crystallographers. The tree includes only a subset of the most notable pioneers of macromolecular crystallography, particularly those mentioned in the present review. The 'British' and 'American' trunks are designated only to show the roots, although they do not in any way describe the nationality of the scientists (who may be citizens of a variety of countries, or even have as many as four simultaneous citizenships, making it rather difficult to assign them to a particular region of the world). Mentorship (in solid lines) has to be taken with a grain of salt because it does not necessarily reflect an official relationship. We aim to show only the simplest connections to the roots; of course, there are many other interactions among these scientists that could not be indicated here because that would make the chart impossibly complicated. Dashed lines indicate individuals working together but not necessarily as a mentor and a mentee.

“The chances of solving the diffraction pictures were practically nil...but that on the other hand, if success were obtained their importance in casting light on the functioning of proteins would almost be infinite.

The product of zero by infinity is anyone's guess, but it might just come off”

WLB to Sir Edward Mellanby, Secretary of the MRC
Supporting funding to Max Perutz.

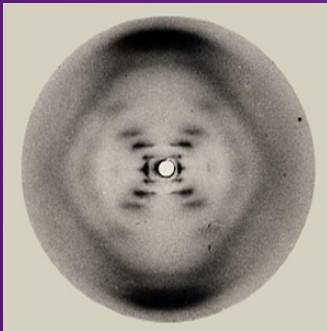
Modern referees please note

It took 25 years – haemoglobin and myoglobin
MRC Laboratory of Molecular Biology at Cambridge

Crystallography has transformed our knowledge of life

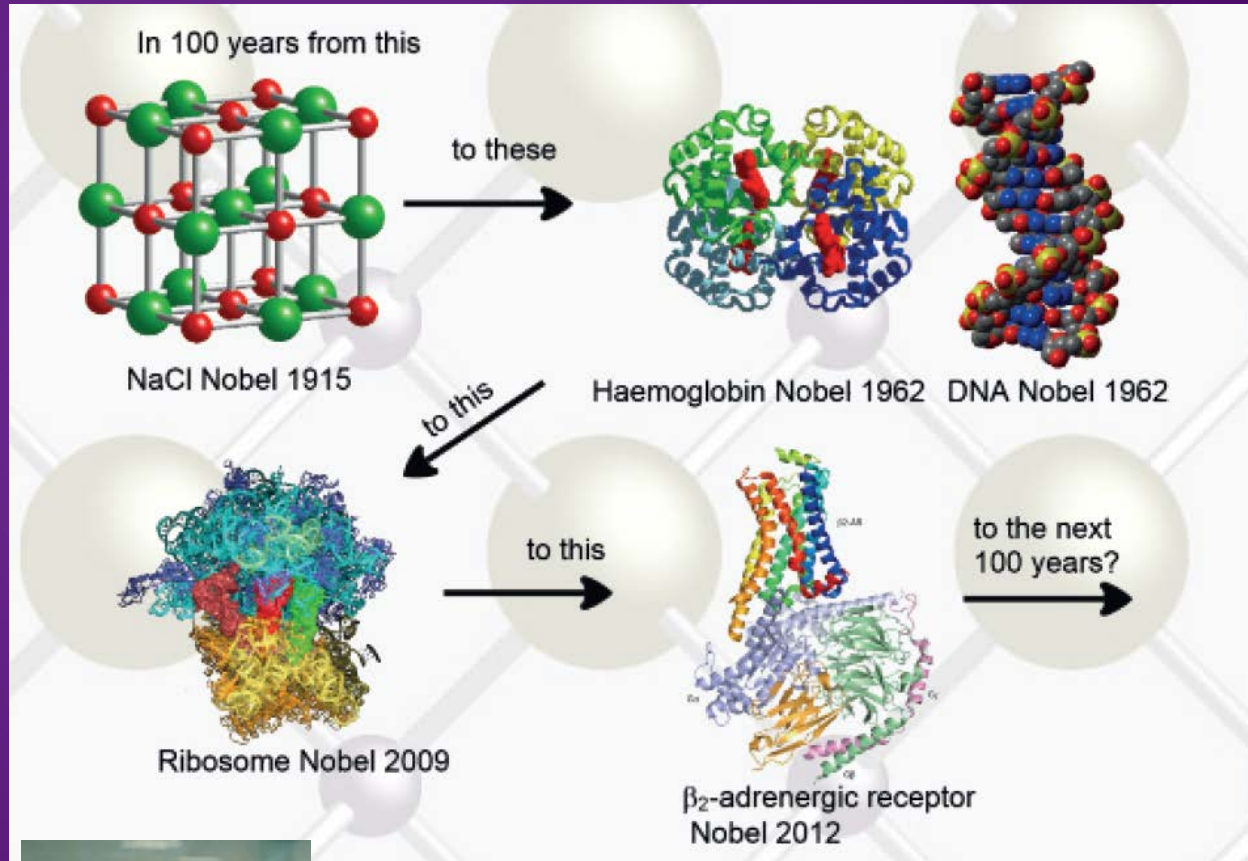


Dorothy Hodgkin
Structure of
Penicillin
Vitamin B12
and much more



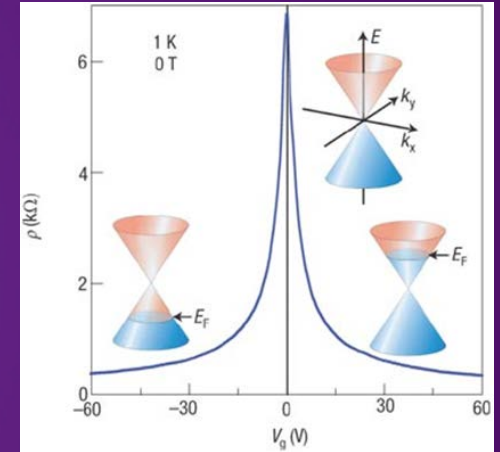
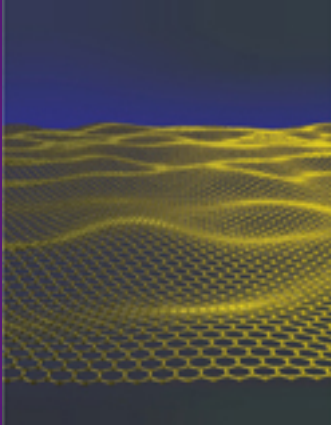
Rosalind Franklin

and Plate 51 – first good
X-ray diffraction picture for DNA



Prof. Dame Louise Johnson
Director Life Sciences, DIAMOND Light Source

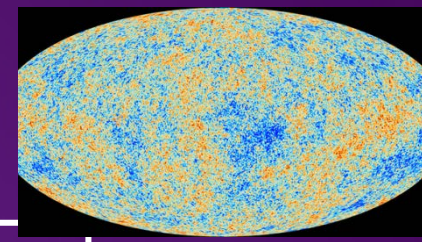
GRAPHENE – NOBEL PRIZE 2010



Andre Geim 2008 - 11th Langworthy => INAUGURAL REGIUS PROFESSOR
Konstantin Novoselov => Latest and 12th Langworthy Professor

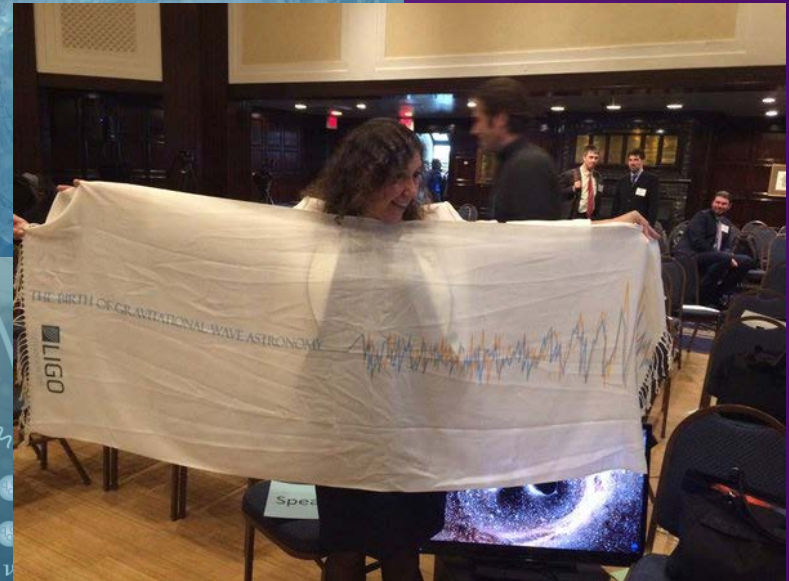
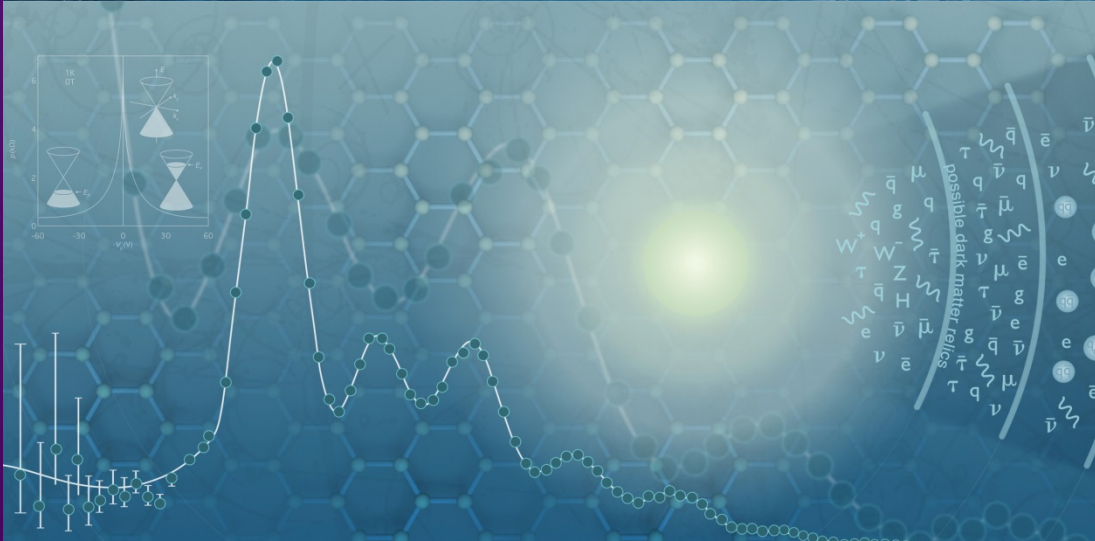
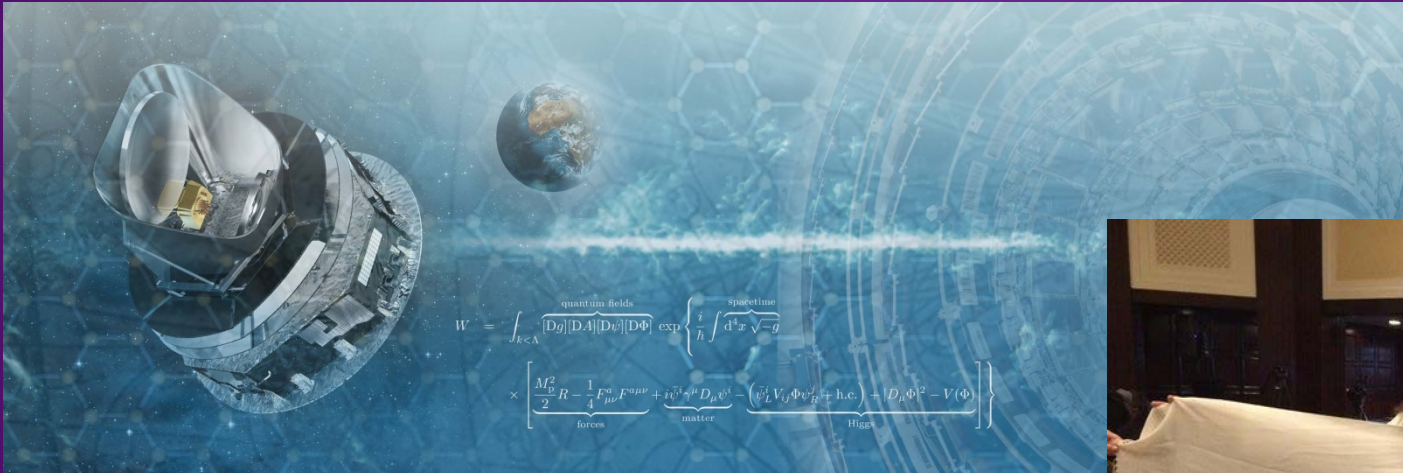


Magnetically levitating a live frog, an experiment that earned Andre Geim and Michael Berry the 2000 Ig Nobel Prize



GRAPHENE 2010 – HIGGS BOSON 2012 – PLANCK 2013
Celebrated on the new panels in the entrance to Schuster

Start of 21st Century as exciting as start of 20th Century



FEB 11 2016
Birth of Gravitational Wave Astronomy !

THEATRE OF DREAMS : Beyond the LHCb Phase 1 Upgrade

YOU HAVE A GREAT AGENDA AND AMBITIOUS GOALS

**THERE ARE PLENTY OF EXCITING KNOWNs AND UNKNOWNs AT THE
START OF THE 21st CENTURY**

HAVE A GREAT MEETING AND FRUITFUL DISCUSSIONS