

Thirty Second

LONDON  
*International*  
YOUTH SCIENCE  
FORTNIGHT

1990

# LONDON INTERNATIONAL YOUTH SCIENCE FORTNIGHT

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Founded by the late Philip S. Green, MBE in 1959, the Science Fortnight aims to give a greater insight into science and its applications for the benefit of mankind and to develop a greater understanding between young people of all nations.

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10 DOWNING STREET  
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THE PRIME MINISTER

In the recent past, great changes have taken place in many parts of the world. Seemingly unchallengeable systems of government and inflexible attitudes have changed dramatically. As a result, in many people's minds this has given new hope that the quality of life can be improved and that the world will be a better and safer place for all of us.

For a scientist about to embark on his or her career these changes, and the possibilities that now exist to a greater degree to work to improve life on earth, offer an exciting challenge. The gains, however, will not all come quickly and it is important in the excitement of exploring new opportunities, not to overlook the scientific principles of testing and verifying and to proceed with caution. Adaptation to change is an important factor. A high priority must be given to righting some of the damage that has been caused to our environment, as well as ensuring that in future greater care is taken to protect our greatest resource - our own planet.

The programme of the Science Fortnight will touch on some of these matters and I am sure that you will find the opportunity to exchange opinions with your counterparts from other countries and cultures a thought provoking and enriching experience.

On behalf of Her Majesty's Government, it gives me great pleasure to welcome you to London and to the Science Fortnight.

## INTERNATIONAL SPONSORS

The Science Fortnight gratefully acknowledges the support and cooperation of the many institutions overseas which select and sponsor participants. The following list is inevitably incomplete, being based on bookings received at the time of going to press (1 March, 1990). Apologies are tendered to those who booked subsequently and have been omitted.

Australia  
CRA National Science Summer School

Bahrain  
University College of Bahrain  
Bahrain School

Belgium  
British School of Brussels

Canada  
Youth Science Foundation  
Manhoba Schools Science Symposium  
Memorial University, Newfoundland

France  
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Athens College  
Moraitis School

Hong Kong  
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Taiwan (Republic of China)  
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Trinidad  
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Symposium  
Navy Science Awards Program

Venezuela  
The British Council

The Science Fortnight gratefully  
acknowledges the assistance of the  
British Council and of the Great Britain  
/ East Europe Centre in facilitating  
participation from a number of overseas  
countries.

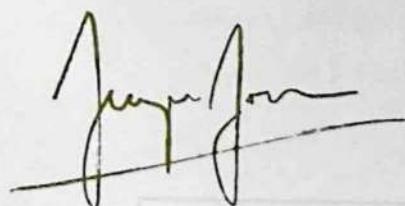
## THIRTY-SECOND LONDON INTERNATIONAL YOUTH SCIENCE FORTNIGHT 1990

As the world witnesses a more open and trusting relationship being developed between the major power blocks, many believe that the consequent reduction in defence spending will release funds for more constructive purposes and the betterment of the quality of life on earth. Vast sums have been spent around the world on the research and development of weapons and other means of destruction. Any diversion of the scientific endeavour and resources that have been deployed on such works is to be welcomed.

It would, however, be naive to believe that we were on the threshold of a great leap forward and that cash and goodwill would solve the world's problems in the foreseeable future.

Although the East-West confrontation has eased there still remains the danger of conflict in other parts of the world. The North-South imbalance with the northern 'haves' and the southern 'have nots' bears the seeds of misunderstanding and distrust from which conflict could all too easily develop. Similarly, overzealous 'nationalists' (one might ask whether 'nationalism is sometimes a synonym for 'prejudice') in pursuit of their own ideals are little mindful of the safety and wellbeing of their neighbours. If the world's peace and stability is the long term aim, much more is needed than a reduction in defence expenditure. An acceptance of the right of all to live and eat, to be safe and healthy in a peaceful environment must be a basic educational concept.

Perhaps the meetings you will have in the Science Fortnight will show you the importance of learning tolerance and respect for others whose culture and ideals may differ greatly from those you hold. Without tolerance and respect, understanding and goodwill, there is little real hope of a more peaceful and secure world, no matter how much defence expenditure is reduced.



George McGowan  
Director  
London International Youth Science Fortnight

## ACKNOWLEDGEMENTS

The Science Fortnight extends its gratitude to all those who have so generously assisted in the organisation of the 1990 meeting, and in particular to:

The Council and Staff of the Institution of Electrical Engineers for providing premises and facilities for lectures and meetings.

The Speakers and Lecturers whose contributions are invaluable.

The academic, commercial and industrial organisations, research establishments, university departments, museums etc which have arranged visits and lectures.

The Wardens, Bursars and Staff of the Halls of Residence where participants are accommodated.

The New Chef in a Box Ltd for the provision of packed meals.

Group Travellers International of Potters Bar for the provision of coach transportation throughout the Science Fortnight.

The many Local Education Authorities and commercial undertakings which sponsor British participants.

British Airways plc for its generous assistance with travel arrangements for students from a number of overseas countries.

The Foreign & Commonwealth Office for its guarantee against loss.

All those who have assisted in the planning and preparation of the programme, together with the many people not included in this list who have, by their generous assistance made the organisation of the 1990 Science Fortnight possible.

## RESIDENTIAL STAFF OF THE LONDON INTERNATIONAL YOUTH SCIENCE FORTNIGHT, 1990

Deputy to the Director: Roger Mulberge  
Chief of Staff: Charles Muller

COLLEGE HALL  
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Host  
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James C Ellis (USA)  
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Jean-Francois Muller (Luxembourg)

The Student Staff of the Science Fortnight is selected from former participants. Applications to serve as staff are not accepted and appointment is by invitation only.

# DAILY PROGRAMME

Wednesday 25 July	Arrivals Welcome & Orientation in Halls of Residence	Thursday 2 August	08.00	Day Visits to Oxford and Cambridge Morning visits to University and Research Establishments Afternoon Tour of City and Colleges
Thursday 26 July	10.00 *Introductions & Programme Briefing 11.00 *OPENING CEREMONY 14.15 *Lecture/Demonstration: 'At Home With Science and Technology' 20.00 Welcome Disco at the Elizabeth Suite	Friday 3 August	10.00	Seminars led by former participants of the Science Fortnight, at University College London and the Institution of Electrical Engineers 14.15 Lecture/Demonstration: 'Chemistry of Light' 20.00 International Cabaret at Carisbrooke Hall
Friday 27 July	20.00 Half Day Visits to Research and Industrial Establishments Student Topics at University College	Saturday 4 August	10.00	*Lecture/Demonstration: Energy On Planet Earth Inter Hall Rounders in Regent's Park Optional Theatre and Concert Visits
Saturday 28 July	10.00 *Lecture/Demonstration: Thunder & Lightning' 14.15 Optional Half Day Sightseeing Tour of London 16.30 Inter Hall Swimming Gala at University of London Union Optional Theatre and Concert Visits	Sunday 5 August	09.00	Optional Day Excursion to (a) Stratford upon Avon (b) Hampton Court & Windsor 20.00 Feature Film at College Hall: Blazing Saddles
Sunday 29 July	09.00 Optional Day Excursions to (a) Stonehenge and Salisbury (b) Portsmouth 20.00 Feature Film at College Hall: Some Like it Hot'	Monday 6 August	10.00	*Participants' Forum I *14.15 Question Time with Members of Parliament 20.00 Hall of Residence Visits
Monday 30 July	10.00 Specialist Lectures *Illustrated Lecture: Nuclear Power – Can we do without it? 20.00 Student Topics at University College, London	Tuesday 7 August	10.00	*Participants' Forum II *CLOSING CEREMONY 20.00 Farewell Disco at the Elizabeth Suite
Tuesday 31 July	21.00 Day Visits to Research & Industrial Establishments Topics for Tonight Informal Discussions in Halls of Residence	Wednesday 8 August		Departures
Wednesday 1 August	10.00 Visits to Scientific Museums at South Kensington 14.15 Seminars at University College, London and the Institution of Electrical Engineers 20.00 *Lecture/Demonstration: 'Immunology and Cancer – Recent Developments in Detection and Treatment'			*Events marked thus take place at The Institution of Electrical Engineers, Savoy Place, London WC2R 0BL

## PRINCIPAL LECTURES AND DEMONSTRATIONS

Thursday 26 July	11.00	<b>Opening Ceremony</b> Speakers will include Professor J M Thomas FRS Director of the Royal Institution of Great Britain and President of the Science Fortnight
	14.15	<b>At Home With Science &amp; Technology</b> Professor Gareth Roberts, BSc, MA PhD DSc FRS Director of Research, Thorn-EMI plc Professor of Engineering Science, University of Oxford
Saturday 28 July	10.00	<b>Thunder and Lightning</b> Dr Frank Palmer, BSc PhD Department of Chemistry, University of Nottingham
Monday 30 July	14.15	<b>Nuclear Power – Can We Do Without It?</b> Harry Cole, CEng MIERE formerly of UK Atomic Energy Research Laboratory, Harwell
Wednesday 1 August	20.00	<b>Immunology and Cancer – Recent Developments in Detection and Treatment</b> Dr Richard O'Kennedy, BSc, PhD, MIBiol MIBiol DipFS Acting Head of School of Biological Sciences City University, Dublin, Ireland
Friday 3 August	14.15	<b>Chemistry of Light</b> Dr Peter Douglas, BSc, PhD and Dr Andrew Mills BSc PhD FRSC Department of Chemistry, University of Swansea
Saturday 4 August		<b>Energy on Planet Earth</b> Professor Trevor M Letcher, PhD Professor of Physical Chemistry Rhodes University, Republic of South Africa
Monday 6 August	10.00	<b>Participants' Forum I</b> Theme: <i>For What Use is Science if Mankind does Not Survive?</i>
	14.15	<b>Question Time with Members of Parliament</b> Andrew Bowden, MBE MP (Conservative) W E (Ted) Garrett, MP (Labour) Lord (Stephen) Ross of Newport, (Social Liberal Democrat)
Tuesday 7 August	10.00	<b>Participants' Forum II</b>
	10.00	
	15.00	<b>Closing Ceremony</b>

## SPECIALIST LECTURES AND SEMINARS

Monday 30 July	10.00	<b>Institution of Electrical Engineers</b>
	A	<b>Guinea Pigs and Patients – The Role of the Controlled Clinical Trial In Cancer Treatment</b> Dr Frances Calman, MB BS MRCP FRCR Department of Radiotherapy and Oncology King's College Hospital, London
	B	<b>Codemakers versus Codebreakers: An Introduction to Cryptography</b> Professor Fred C Piper BSc PhD ARCS DIC FIMA Professor of Mathematics Royal Holloway & Bedford New College University of London
	C	<b>Molecular Symmetry, Reactivity &amp; Spectroscopy</b> Dr Alison Rodger, BSc (Sydney) MA (Oxford) Physical Chemistry Laboratory, University of Oxford
	D	<b>Fossils, Evolution and the Origin of Species</b> Dr Peter Sheldon, BSc PhD Department of Geology, University College Cardiff
Wednesday 1 August	14.15	<b>Seminars 1-3: Institution of Electrical Engineers</b> <b>Seminars 4-5: University College London Engineering Building</b>
	1	<b>A Beginner's Guide to Food Analysis</b> Dr Suzanne E Emmett, BSc (Wales) PhD Cert Ed Food Research Association, Leatherhead
	2	<b>Traditional Medicine – Does It Have A Future?</b> Dr Peter J Hylands, BPharm PhD CChem FRSC Xenova Ltd, Slough, Berkshire
	3	<b>How Green is Space?</b> Dr Alan Johnstone, BSc MSc PhD Mullard Space Science Laboratory, University College London
	4	<b>'Elementary, My Dear Watson'</b> Martin L Perkins, MA (Oxon) FIMA FRSA Senior Master & Head of Mathematics St Olave's Grammar School, Orpington
	5	<b>Two Brains in One Head – a Problem in Communication</b> Dr George E Savage, BSc PhD School of Biological Sciences, Queen Mary & Westfield College, University of London

## SEMINARS LED BY FORMER PARTICIPANTS

Friday 3 August	10.00	Seminars I-III: Institution of Electrical Engineers Seminars IV-VII: University College London, Engineering Bldg
I		<i>Immunodeficiency – Acquired Immunodeficiency Syndrome</i> Dr Miguel Forte (1976). LicMed(Lisbon) DTM&H(London) Hospital Santa Maria (Lisbon, Portugal) – currently undertaking research at East Birmingham Hospital on a grant from the Calouste Gulbenkian Foundation
II		<i>Learning to Play the System</i> Stephen Jackson (1985) BA (Mod) (Maths & Science) GJW Government Relations Ltd, London
III		<i>The Science of Anthropology?</i> Alex Lee (1986) BSc Preparing Doctoral thesis, National Taiwan University
IV		<i>Manufacturing, Marketing and Money – A Different View of Science</i> Nigel Lee (1984) MEng (Hons) ACGI Andersen Consulting, London
V		<i>Science and the Law</i> Charles Muller (1982), LLM Lawyer, Grand Duchy of Luxembourg
VI		<i>At The Speed Of Light</i> L Lames St Ville (1986) BSc(Eng) GEC Marconi Research Ltd
VII		<i>Environment and Technology</i> Benoit Templier (1982) Ingénieur des Arts et Manufactures Renault Motor Company, France

The speaker's first year of participation in the Science Fortnight is indicated in parenthesis after his name

## TOPICS FOR TONIGHT

Informal discussions led by Science Fortnight Staff

Tuesday 31 July	21.00	College Hall <i>Genetic Engineering – Should We Play God?</i> introduced by Roger Pepin
		Ifor Evans Hall <i>Embryo Research – What Price for Progress?</i> introduced by Keith Martin
		International Hall <i>Attitudes to Animals</i> introduced by Judith Purdy

## HALF DAY VISITS TO INDUSTRIAL & RESEARCH ESTABLISHMENTS & TO UNIVERSITY DEPARTMENTS

Friday, 27 July	Royal Naval College, Greenwich Dept of Nuclear Sc & Technology
BBC Television Centre	St Bartholomew's Hospital Dept of Histopathology
British Gas plc	J Sainsbury plc
South Eastern Gas, Croydon	University College London
Brunel University, Computer Centre	Department of Chemistry
City University	Department of Electronic & Electrical Engineering
Department of Mechanical Engineering & Aeronautics	Thames Water Utilities
GEC Research Ltd	Beckton Sewage Treatment Works
Hirst Research Centre	Wellcome Museum of the History of Medicine
Imperial College of Science	Zoological Society of London
Technology and Medicine	Institute of Zoology, Dept of Veterinary Medicine
Dept of Chemical Engineering	
King's College London	
Chelsea Department of Pharmacy	
Department of Biophysics	

## DAY VISITS TO INDUSTRIAL & RESEARCH ESTABLISHMENTS

Tuesday, 31 July	Royal Botanic Gardens, Kew Royal Marsden Hospital, Sutton Royal Navy Institute of Naval Medicine
British Petroleum	Shell Research Ltd Sittingbourne
BP Research Centre	SIRA Ltd, Chislehurst
Exxon Chemical Ltd	Smith Kline Beecham Research Ltd
Esso Petroleum Co Ltd	STC Technology Ltd, Harlow
Fawley Refinery	University College London
Freemans plc	Mullard Space Science Laboratory
Distribution Division, Peterborough	
National Inst for Medical Research	
Nuclear Electric	
Dungeness A & B Power Stations	
Royal Air Force	
Institute of Aviation Medicine	

## VISITS TO OXFORD & CAMBRIDGE

Thursday, 2 August	Oxford
Cambridge	<i>University of Oxford</i>
<i>University of Cambridge</i>	University of Oxford
University Chemical Laboratory	University Botanic Garden
Department of Physics	Department of Engineering Science
Cavendish Laboratory	Department of Physics
Department of Engineering	Clarendon Laboratory
Department of Medicine	Oxford Scientific Firms Ltd
Physiological Laboratory	
British Antarctic Survey	
NAPP Laboratories Ltd	
St John's Innovation Centre	

## STUDENT TOPICS

Participants who wish to give a paper based on a project or investigation they have undertaken will be allocated a period during one of the sessions listed below. Papers will be grouped by category and a schedule published at the beginning of the Science Fortnight.

Friday 27 July 20.00 University College, London, Engineering Building  
Lecture Theatres: G6, 421, 422, 508

Monday 30 July 20.00 University College, London, Engineering Building  
Lecture Theatres: G6, 421, 422, 508

## MUSEUM VISITS

Wednesday 1 August 10.00 Geological Museum  
Exhibition Road, South Kensington, London SW7

10.00 Natural History Museum  
Cromwell Road, South Kensington, London SW7

10.00 Science Museum  
Exhibition Road, South Kensington, London SW7

## SOCIAL PROGRAMME

Thursday 26 July 20.00 Welcome Disco  
The Elizabeth Suite, Gresham Street, London EC2

Saturday 28 July 16.30 Inter Hall Swimming Gala  
University of London Union, Malet Street, London WC1

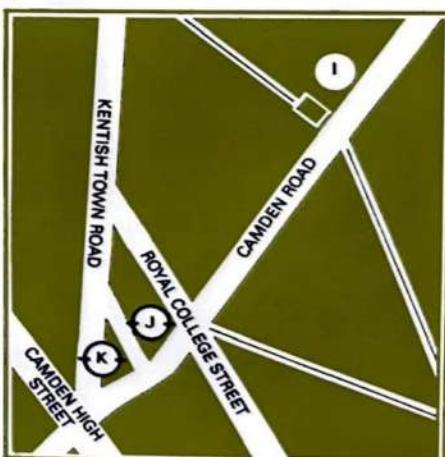
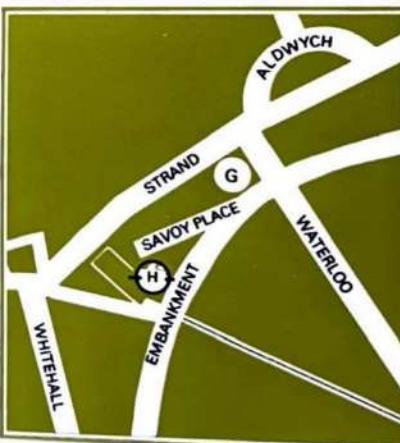
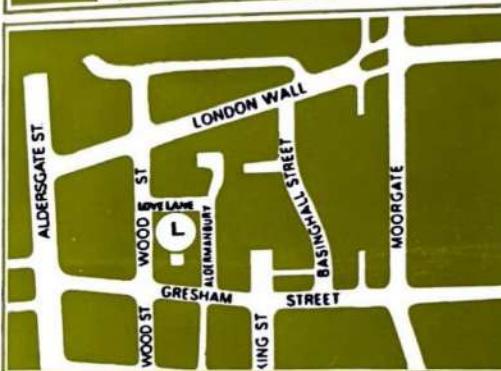
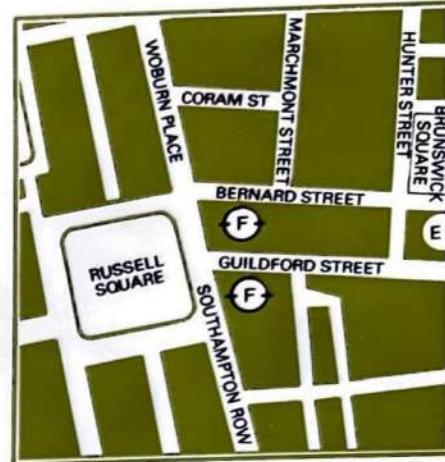
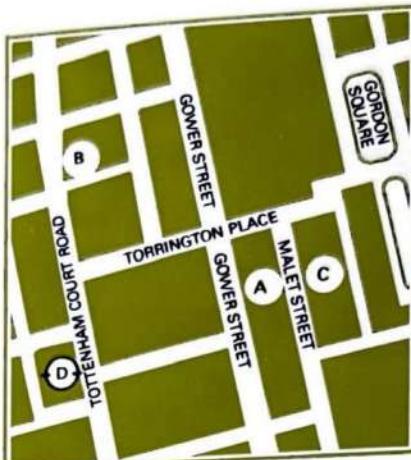
Sunday 29 July 20.00 Feature Film: *Some Like It Hot*  
College Hall, Malet Street, London WC1

Friday 3 August 20.00 International Cabaret  
Carisbrooke Hall, Seymour Street, London W2

Saturday 4 August 14.15 Inter Hall Rounders Competition  
Regent's Park, London NW1

Sunday 5 August 20.00 Feature Film: *Blazing Saddles*  
College Hall, Malet Street, London WC1

Tuesday 7 August 20.00 Farewell Disco  
Elizabeth Suite, Gresham Street, London EC2



### KEY TO MAPS

- A College Hall
- B Empire Rooms
- C University of London Union
- D Goode Street Station
- E International Hall
- F Russell Square Station
- G Institution of Electrical Engineers
- H Embankment Station
- I Ifor Evans Hall, 109 Camden Road
- J Camden Town Underground
- K Camden Road Station
- L Elizabeth Suite

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INTERNATIONAL  
YOUTH SCIENCE FORUM  
24 July to 7 August 1994