



**The  
International  
Science School  
archives**



THE UNIVERSITY OF  
**SYDNEY**

## Contents

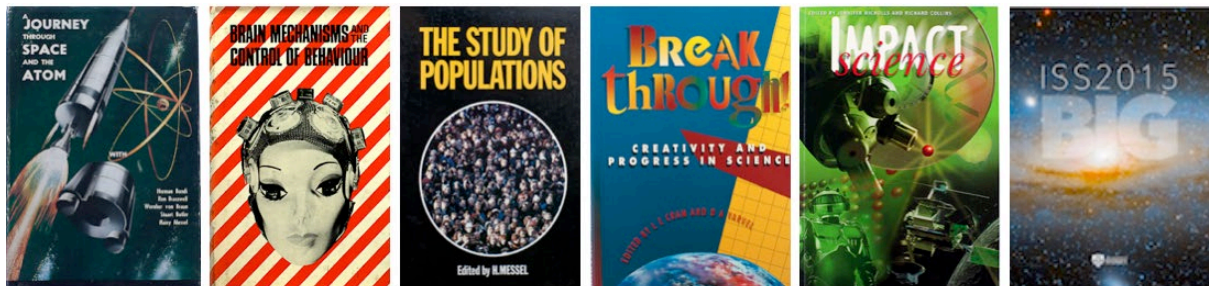
Introduction: The International Science School.....	3
Our Story .....	4
ISS2017: Future Power .....	6
ISS2015: BIG .....	8
ISS2013: NANOSCIENCE.....	11
ISS 2011: Light & Matter .....	14
ISS2009: Genes to Galaxies .....	17
ISS2007: ecoscience.....	20
ISS2005: Waves of the Future .....	23
ISS2003: Impact Science.....	26
ISS2001: Impact Science.....	29
ISS1999: Millennium Science.....	31
ISS1997: Light .....	33
ISS1995: Breakthrough! Creativity and Progress in Science.....	36
ISS1993: Carbon - Element of Energy and Life .....	38
ISS1991: Living with the Environment .....	40
ISS1989: Today's Science, Tomorrow's Technology .....	42
ISS1987: Highlights in Science .....	44
ISS1985: The Study of Populations .....	47
ISS1983: Science Update.....	49
ISS1981: Biological Manipulation of Life .....	51
ISS1979: Energy for Survival .....	54
ISS1977: Australian Animals and Their Environment.....	57
ISS1975: Our Earth.....	60
ISS1974: Solar Energy.....	62
ISS1973: Focus on the Stars .....	64
ISS1972: Brain Mechanisms and the Control of Behaviour .....	67
ISS1971: Molecules to Man.....	69
ISS1970: Pioneering in Outer Space .....	71
ISS1969: Nuclear Energy Today and Tomorrow .....	73
ISS1968: Man in Inner and Outer Space.....	75
ISS1967: Apollo and The Universe .....	77
ISS1966: Atoms to Andromeda.....	79
ISS1965: Time .....	81
ISS1964: Light and Life in the Universe .....	84
ISS1963: The Universe of Time and Space.....	86
ISS1962: International Science School Archives .....	88



# Introduction: The International Science School

The ISS has been running for more than 50 years. In that time, well over 4000 talented high school students have passed through the program — which means everyone who attends is joining a global network of ISS alumni, all sharing in the same amazing experience.

Look back through this archive to see the latest school programs, all the way back to where the school began. And check out the appendix for the full class lists.



# Our Story



*“My motto has always been honouring excellence, and the ISS has honoured that beautifully.” ~ Harry Messel*

The first ISS was held in 1958. The initial program was developed for high school teachers, but after four years the ISS shifted its focus to science education for senior high school students, in order to encourage talented young people to pursue further studies and careers in science.

The ISS has always welcomed and encouraged international students to attend. One student from New Zealand came to the first science program, and many more have since attended from Britain, Canada, China, India, Japan, Malaysia, Thailand and the USA.

Since 2005 at least five scholarships have been offered to Indigenous students as part of the Indigenous Scholars Program, designed to encourage participation in science. For the first time in its history, eight Indigenous scholars participated in the 2011 ISS program.



Between 1960 and 1979 the ISS lectures were shown on television, with audiences of up to 100,000 people. Many will recall waking up early on Sundays to make sure they didn't miss the telecast.

In 2003 part of the lecture series was broadcast on the Internet as a trial run, and in 2007 the entire series was made available as both video webcast and audio podcast.



This continues today. The books of recent ISS lecture series are also available online, to encourage a truly international science readership.

Over the past 50 years the ISS has welcomed more than 4,000 students, inspiring and changing the lives of many science scholars.

To ensure that this unique program can continue, the Physics Foundation is building the Messel Endowment, a fund to secure the future of the ISS in perpetuity.

# ISS2017: Future Power

## The International Science School Archives

### Challenges, Opportunities, Solutions!

The 39th Professor Harry Messel International Science School, ISS2017: *Future Power*, ran from July 2-15 2017. The program focussed on the future energy needs of our planet, and featured top international and Australian researchers, including solar energy pioneer Kylie Catchpole, nuclear fusion leader Steven Cowley, smart grid engineer Tony Vassallo, energy innovation expert Jenny Gerbi ... and many more!

**Number of scholars attending: 138** (68 female, 70 male)



## Watch the Videos

Want more? You can watch all of the [ISS2017 lectures on YouTube](#), including:

- [Professor Steven Cowley](#) from Oxford, talking about nuclear fusion and the incredible ITER experiment currently being built in France



- [Professor Kylie Catchpole](#) on the latest in high-efficiency solar cells
- [Dr Jenny Gerbi](#), from the USA's Advanced Research Programs Agency — Energy, on finding solutions to the difficult energy problems we face in ways that society actually will want to use

## **The Speakers**

Professor Kylie Catchpole, ANU  
**Solar Energy & High-Efficiency Solar Cells**

Dr Jenny Hayward, CSIRO  
**Predicting the Future: Economic Modelling at CSIRO Energy**

Professor Steve Cowley, Oxford, UK  
**Energy from Nuclear Fusion**

Dr Karl Kruszelnicki, Julius Sumner Miller Fellow, University of Sydney  
**Great Moments in Science**

Professor Tony Vassallo, Engineering, University of Sydney  
**When Energy Grids Get Smart**

Assoc. Prof. Tara Murphy, Physics, University of Sydney  
**Extreme Events: Exploring the Transient Universe**

Prof. Annette Haworth, Medical Physics, University of Sydney  
**A Day in the Life of a Medical Physicist**

Prof. Andrew Stuchbery, Physics, ANU  
**Nuclear Power: Past, Present and Future**

Dr Nicole van der Laak, Gelion  
**Battery Basics, and Making Them Better**

Professor Bernadette McCabe, USQ  
**Bioenergy and Biofuels**

Dr Jenny Gerbi, ARPA-E, USA  
**30 Million Dollars to Change The World**

# ISS2015: BIG

## The International Science School Archives

**Big ideas, big experiments, big challenges — big science!**

The 38th Professor Harry Messel International Science School, ISS2015: *BIG*, ran from June 28th to July 11th 2015. The program featured top international and Australian researchers from the breadth of science, including renowned cosmologist and author Lawrence Krauss, galaxy explorer and Square Kilometre Array leader Naomi McClure Griffiths, nanoscientist and brain mapper Michael Roukes, and NASA astronaut Greg Chamitoff.

**Number of scholars attending: 138** (68 female, 70 male)

## Get The BIG Book

As a [PDF file](#) (around 30MB), which can be read on any computer.

As an [iBook for the iPad, iPhone or Mac computer](#) (40MB ibooks file): you will need the iBooks app on your iPad or Mac to view the book.



## Watch the BIG Videos





Want more? You can watch all of the [ISS2015 lectures on YouTube](#), including:

- [Professor Lawrence Krauss](#), renowned cosmologist and best-selling author, talking about the current state of our understanding of the universe
- [Professor Naomi McClure-Griffiths](#) on her explorations of the Milky Way Galaxy
- [Professor Greg Chamitoff](#), NASA astronaut and aerospace engineer, on the challenges of human space exploration

## The Speakers

Professor Lawrence Krauss, Arizona State, USA  
**Cosmology**

Dr Anita Ho-Baillie, UNSW  
**High-Efficiency Solar Cells**

Professor Michael Roukes, Caltech, USA  
**Nanoscience & Brain Mapping**

Dr Karl Kruszelnicki, Julius Sumner Miller Fellow, University of Sydney  
**Great Moments in Science**

Professor David Reilly, EQUUS, School of Physics, University of Sydney  
**Quantum Systems and Quantum Information**

Professor Naomi McClure-Griffiths, ANU  
**Exploring the Milky Way**

Dr Martin White, Adelaide University  
**Searching for Dark Matter at the Large Hadron Collider**

Dr Stuart Prescott, UNSW  
**Surface Chemistry**

Professor Jennie Brand-Miller, University of Sydney  
**Diet & Obesity**

Professor Greg Chamitoff, University of Sydney and NASA  
**Human Space Exploration**

A/Professor Matthew Hole, ANU  
**ITER and Fusion Energy**





# ISS2013: NANOSCIENCE

## The International Science School Archives

The 37th Professor Harry Messel International Science School, ISS2013: *Nanoscience*, ran from June 30th to July 13th 2013. The program featured top international and Australian nanoscience experts, along with leaders from the breadth of science, including keynote speaker and Nobel prize-winning cosmologist Professor Brian Schmidt.

**Number of scholars attending: 136** (72 female, 64 male)

## Get The Book!



Each ISS lecture series is accompanied by a book — in 2013 we produced an ebook version containing interviews with each of our inspiring speakers.

[PDF file](#) (around 15MB), which can be read on any computer.

[iBook for the iPad](#) (50MB iBooks file from iTunes): you will need the iBooks app to download the file.

## Watch the Videos!



Want more? You can watch all of the [ISS2013 lectures on YouTube](#), including:

- [Professor Brian Schmidt](#), Nobel Prizewinning cosmologist, talking about the expanding universe
- [Dr Amanda Barnard](#) from CSIRO, exploring nanomaterials and the amazing properties of graphene
- [Professor Gerard Milburn](#) from the University of Queensland, with the strange world of quantum mechanics and the promise of quantum computing and other quantum devices

### The Speakers

Professor Michael Roukes, Caltech, USA  
**Nanoscience**

Professor Peter Waterhouse, School of Molecular Bioscience, University of Sydney  
**RNA Interference and Gene Silencing**

Professor Philip Russell, Max Planck Institute for the Science of Light, Erlangen, Germany  
**Nanophotonics and Holey Fibres**

Dr Karl Kruszelnicki, Julius Sumner Miller Fellow, University of Sydney  
**Great Moments in Science**

Professor David Reilly, EQUUS, School of Physics, University of Sydney  
**Quantum Systems and Quantum Information**

Dr Amanda Barnard, CSIRO  
**Graphene and Nanoparticles**

Professor Gerard Milburn, EQUUS, University of Queensland  
**Quantum Weirdness, Quantum Systems, Quantum Computing**

Professor Tanya Monro, IPAS, University of Adelaide  
**Nanophotonics and Advanced Sensing**

Professor Maria Kavallaris, Australian Centre for Nanomedicine, UNSW  
**Nanomedicine and Cancer**

Professor Brian Schmidt, Mt Stromlo Observatory, ANU  
**The Expanding Universe**

Professor Ben Eggleton, CUDOS, School of Physics, University of Sydney  
**The Photonics Revolution**



# ISS 2011: Light & Matter

## The International Science School Archives

The 36th Professor Harry Messel International Science School, ISS2011: *Light & Matter*, ran at the University of Sydney in July 2011. The program featured top international and Australian researchers from the breadth of science, including Sir John Pendry, Chair in Theoretical Solid State Physics at Imperial College, London, and Professor Allan Clark, Director of the Department of Nuclear and Particle Physics at the University of Geneva and member of the ATLAS experiment team at the Large Hadron Collider.

**Number of scholars attending: 143** (62 female, 81 male)



**Get the book!**

[PDF file](#) (around 6MB), which can be read on any computer.

**Watch the Videos!**





Want more? You can watch all of the [ISS2011 lectures on Vimeo](#), including:

- [Professor John Pendry](#), world-renowned nano-photonics researcher, on metamaterials and invisibility
- [Professor Allan Clark](#) from the Large Hadron Collider, on the search for the Higgs Boson
- [Dr Deanna D'Alessandro](#) from the University of Sydney's School of Chemistry, speaking on new technologies to capture carbon dioxide

## The Speakers

S Bartlett, Associate Professor, School of Physics, The University of Sydney  
***Smaller, Faster, Better, Unimaginable-Er? The Quantum Revolution is Coming***

C Charles, Head, Space, Plasma and Propulsion Laboratory, The Australian National University  
***Children of the Stars, Plasma is the Fourth State of Matter***

AG Clark, Director, Department of Nuclear and Particle Physics, University of Geneva  
***A Very Large Microscope to Probe Very Small Distances Part I***  
***A Very Large Microscope to Probe Very Small Distances Part II***

D D'Alessandro, ARC Queen Elizabeth II Fellow, School of Chemistry, The University of Sydney  
***Capturing Co<sub>2</sub>***

M Green, Federation Fellow and Scientia Professor, The University of NSW  
***Photovoltaics: Solar Electricity by Coupling Light and Matter***

K Kruszelnicki, Julius Sumner Miller Fellow, The University of Sydney  
***Bending Spoons for Fun and Profit***  
***Spontaneous Human Combustion***  
***Twinkling Stars***

Sir J Pendry, Imperial College, London, UK  
***Metamaterials and the Science of Invisibility***

***Negative Refraction and a Perfect Lens***

S Simpson, Laureate Fellow, School of Biological Science, The University of Sydney  
***Paintbrushes, Cannibal Crickets and Human Obesity***

F Watson, Astronomer in Charge, The Anglo-Australian Observatory,  
Coonabarabran, NSW

***Dark Secrets: Dark Matter, Dark Energy and Dark Skies***

J Whittaker, Post-doctoral Fellow, EarthByte Group, School of Geosciences, The  
University of Sydney, RD Miller, Professor of Geophysics and Laureate Fellow,  
School of Geosciences, The University of Sydney

***Exploring The Earth's Varied And Dynamic Seafloor***



# ISS2009: Genes to Galaxies

## The International Science School Archives



### Participants

138 (67 boys; 71 girls)

### Convenors

A Green, A Selinger

### Lecturers

H Johnston, Senior Lecturer, School of Physics, The University of Sydney  
***The Private Life of a Proton***

K Kruszelnicki, Julius Sumner Miller Fellow, The University of Sydney  
***The X-Chromosome eXplained***  
***Man on Moon Conspiracy***

W Lee, Altair Vehicle Systems Manager, NASA, USA

***Six Minutes of Terror***

W Lee, Altair Vehicle Systems Manager, NASA, USA, EK Hines, Jet Propulsion Laboratory, California, USA

***New Stars in NASA's Constellation***

GF Lewis, School of Physics, The University of Sydney

***Cosmic Evolution: The Birth, Life and Death of Galaxies***

CH Lineweaver, Coordinator, Planetary Science Institute, The Australian National University, Associate Professor, Research School of Astronomy and Astrophysics and Research School of Earth Sciences

***Cosmobiology: Our Place in the Universe***

M Manetsch, Post-doctoral Fellow, The University of Sydney, EE Ramsay, The University of Sydney, AJ Ammit, Associate Dean (Research and Innovation), Faculty of Pharmacy, The University of Sydney

***Asthma and Airway Remodelling: Targeting Mitogen-activated Protein Kinases as Future Therapeutics***

NM McClure-Griffiths, Senior Post-doctoral Fellow, CSIRO Australia Telescope National Facility

***A Walk Around the Neighbourhood: Understanding the Nature and Structure of the Milky Way***

J Brand Miller, Chair, Human Nutrition, School of Molecular and Microbial Biosciences, The University of Sydney, N Mann, Associate Professor for Nutrition and Food Science, RMIT, L Cordain, Professor, Department of Health and Exercise Science, Colorado State University

***Paleolithic Nutrition: What did our Ancestors Eat?***

M Morange, Professor of Biology and Director, Center for the Study of the History of Science, Ecole normale supérieure, Paris

***The Frontiers of Current Biological Research***

J Tarter, Bernard M Oliver Chair for SETI, Director, Center for SETI Research, SETI Institute, California, USA

***SETI - Planning for Success: Who Will Speak to Earth? What Will They Say? Extremophiles and Exoplanets***

M Walter, Director, Australian Centre for Astrobiology, The University of NSW

***The Search for the Earliest Life on Earth***

***The Search for Life on Mars***

P Waterhouse, ARC Federation Fellow, Molecular and Microbial Biosciences, School of Molecular Bioscience, The University of Sydney

***Gene Silencing I: A Virus Defence Pathway and a Technology***

***Gene Silencing II: Gene Regulation***





# ISS2007: ecoscience

## The International Science School Archives



### Participants

133 (68 boys; 65 girls)

### Convenors

C Stewart, A Green

### Lecturers

B Brook, Foundation Chair of Climate Change, The University of Adelaide

***Extinction – Past and Present***

***The Future of Biodiversity in the Changing World***

M Curran, Australian Government Antarctic Division and ACE CRC, Hobart, Tasmania

***Secrets from Antarctic Ice***

M Dasgupta, Department of Nuclear Physics, The Australian National University  
***Stardust All Around Us: Fusion and Element Formation***

M Dasgupta, Department of Nuclear Physics, The Australian National University, S  
Tims, Research Fellow, Accelerator Mass Spectrometry group, The Australian  
National University

***Unstable Atoms as Detectives***

H Durant-Whyte, Australian Centre for Field Robotics, The University of Sydney  
***The Robots Are Coming!***

K Kruszelnicki, Julius Sumner Miller Fellow, The University of Sydney

***Mouse with Human Ear***

***Uluru to You***

***Vitamins Not Always Safe***

***Folding Paper***

***Exploding Body in a Vacuum***

***Water Recycling***

I Lowe, President, Australian Conservation Foundation

***Renewable Energy Technologies: Key to Sustainable Futures***

***Shaping a Sustainable Future – An Outline of the Transition***

V Metcalf, School of Biological Sciences, University of Canterbury, Christchurch,  
New Zealand

***Fishy Tales from Antarctica***

***Extreme Living in Antarctica***

M Oppenheimer, Albert G Milbank Professor of Geosciences and International  
Affairs, Princeton University, USA

***How Warm is Too Warm? Avoiding Dangerous Climate Change***

G Pearman, Consultant and Interim Director, Monash Sustainability Institute,  
Monash University

***The Warming Planet***

***Climate Change: Impacts and Adaptation***

R Salmon, Educator and Outreach Coordinator, International Polar Year

***The Poles and the Planet: International Polar Year***

F Watson, Astronomer in Charge, The Anglo-Australian Observatory,  
Coonabarabran, NSW

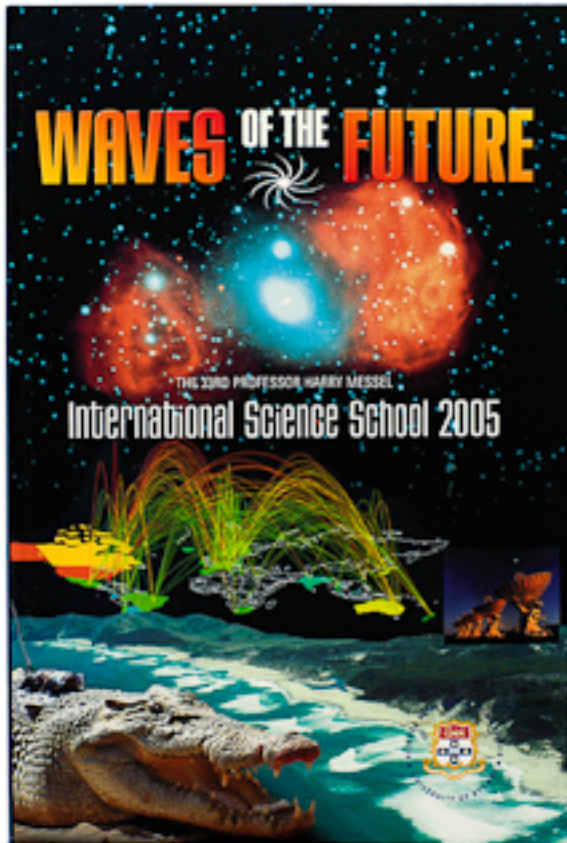
***Dark Secrets: Dark Matter, Dark Energy and Dark Skies***





# ISS2005: Waves of the Future

The International Science School Archives



## Participants

139 (73 boys; 66 girls)

## Convenors

C Stewart, RG Hewitt

## Lecturers

C Baldock, Senior Lecturer and Director, Institute of Medical Physics, School of Physics, The University of Sydney

***The Treatment of Cancer using Ionising Radiation***

S Carlile, Lecturer in Neuroscience, Department of Physiology, The University of Sydney

***The Psychophysics of Real and Virtual Auditory Spaces***

D Cockayne, Professor, Department of Materials, University of Oxford, UK  
***Seeing in the Nanoworld***  
***Building in the Nanoworld***

H Rubinsztein-Dunlop, Head of Physics, Director of the Centre for Biophotonics and Laser Science, University of Queensland  
***Catch, Move and Twist with Optical Tweezers: Biophotonics at Work***

J Hope, ARC Centre of Excellence for Quantum-Atom Optics, The Australian National University  
***Quantum Mechanics: The Wild Heart of the Universe***

J Kay, Associate Professor, School of Information Technologies, The University of Sydney  
***Creating and Overcoming Invisibility: Scrutably Personalised Ubiquitous Computing***

L Morawska, Professor, School of Physical and Chemical Sciences, Queensland University of Technology  
***The Science of the Aerosols we Breathe***

R Morganti, Foundation for Research in Astronomy, The Netherlands  
***The Ever Changing Life of Galaxies***  
***Monsters Lurking in the Centre of Galaxies***

H Price, ARC Federation Fellow and Challis Professor of Philosophy, Head, Centre for Time, Department of Philosophy, The University of Sydney  
***Einstein and the Quantum Spooks***

F Seebacher, School of Biological Sciences, The University of Sydney  
***Radio Telemetry in the Study of Wildlife***

M de Sterke, Reader, CUDOS, School of Physics, The University of Sydney  
***Telecommunications: The Here and Now***  
***Telecommunications: Looking to the Future***

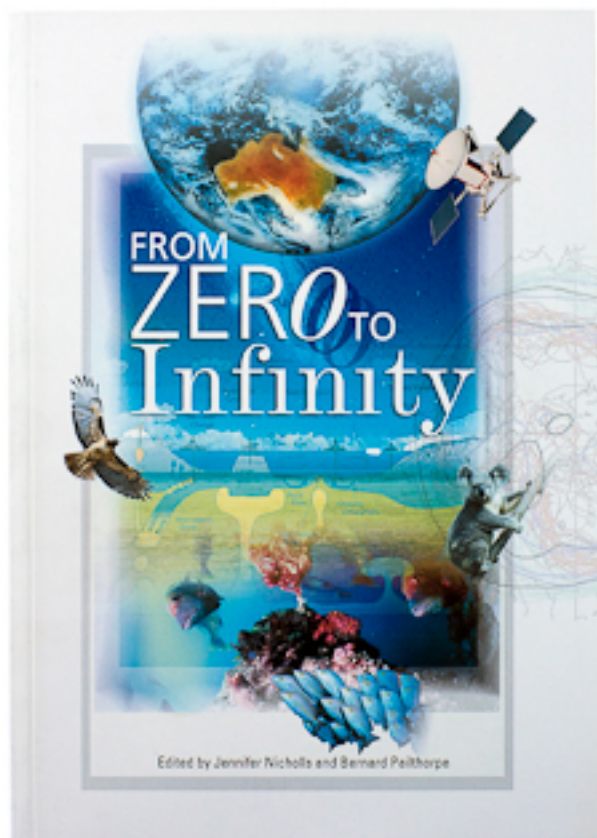
P Robinson, ARC Research Fellow, School of Physics, The University of Sydney  
***Understanding Brain Dynamics***

AD Short, Professor, School of Geosciences, The University of Sydney  
***Wind, Waves and Beaches***



# ISS2003: Impact Science

## The International Science School Archives



### Participants

139 (54 boys; 85 girls)

### Convenors

JA Nicholls, BA Pailthorpe

### Lecturers

R Codd, BVR Lecturer in Bioorganic Chemistry, School of Chemistry, The University of Sydney

***Biomolecules from Extremophilic Life***

CR Dickman, School of Biological Sciences, The University of Sydney

***Australian Native Animals: Marsupials***



JI Freidman, William A Coolidge Professor of Physics, Department of Physics, Massachusetts Institute of Technology, USA and J Ulrichs, School of Physics, The University of Sydney

***The Road to Quarks and Beyond***

DN Jamieson, Director, Microanalytical Research Centre, School of Physics, University of Melbourne

***Ions from Space: Cosmic Rays, Aviation and You***

LM Leslie, Director, Centre for Environmental Modelling and Prediction, The University of NSW and Robert E Lowry Chair, The University of Oklahoma, USA

***High Resolution Computer Weather Forecasting Part I: Background***

***High Resolution Computer Weather Forecasting Part II: Applications***

GF Lewis, School of Physics, The University of Sydney

***Galactic Cannibalism***

V Meadows, Principal Investigator, NASA Astrobiology Institute, California, USA

***The Search for Planets Around Other Stars: Dancing in the Dark***

***The Search for Habitable Worlds: How Would We Know One if We Saw One?***

RD Müller, Director, University of Sydney Institute of Marine Science, The University of Sydney

***Understanding How the Earth Works: A Geodynamic Revolution Based on***

***Linux Computing***

***Marine Geo-informatics***

A Salih, Research Fellow, Electron Microscope Unit and The Australian Key Centre for Microscopy and Microanalysis, The University of Sydney

***An Exploration of Light Regulating Pigments of Reef-building Corals from***

***Macro- to Micro- and Nano-scales***

V Trimble, Professor of Physics, University of California, USA, and Visiting Professor of Astronomy, University of Maryland, USA

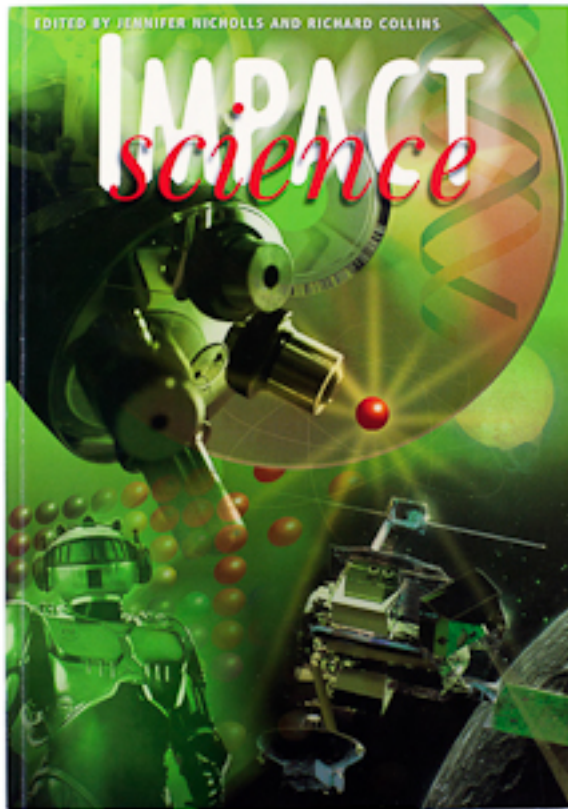
***Warmed by the Sun***

***Fed by the Stars***



# ISS2001: Impact Science

## The International Science School Archives



### Participants

141 (70 boys; 71 girls)

### Convenors

JA Nicholls, RE Collins

### Lecturers

RE Collins, Director, the Science Foundation for Physics, The University of Sydney  
***Vacuum Glazing: A Case Study in Innovation Part 1: Science and Technology***  
***Vacuum Glazing: A Case Study in Innovation Part 1: Other Important Things***

RG Gilbert, Director, Key Centre for Polymer Colloids, School of Chemistry, The University of Sydney  
***Polymer Science and Everyday Life***

I Johnston, School of Physics, The University of Sydney  
***Reflections on the Future of Science 1: The Future's Not What it Used to Be***  
***Reflections on the Future of Science 2: Mirror Mirror on the Wall***

AJ Green, Senior Lecturer, School of Physics, The University of Sydney  
***Astronomy – Instruments from the Past***  
***Astronomy – What Instruments for the Future?***

T Monro, Research Fellow, Optoelectronics Research Centre, University of Southampton, UK  
***The Communications Revolution***  
***New Technology for Communications***

MY Simmons, Australian Research Council Queen Elizabeth II Research Fellow, School of Physics, The University of Sydney  
***Quantum Computing***  
***Nanotechnology: Physics, Chemistry and Biology Unite at the Ultra-small Scale***

M Stewart, Head, Structural Cell Biology Group, Structural Studies Division, Medical Research Council Laboratory of Molecular Biology, UK  
***The Physics of Life***  
***The Impact of Genomics on Biology and Medicine***





# ISS1999: Millennium Science

## The International Science School Archives



### Participants

139 (73 boys; 66 girls)

### Convenors

ST Butler and H Messel

### Lecturers

M Baltuck, NASA Senior Representative in Australia  
***Space Exploration***

W Britton, Head of the Immunology Unit, Department of Medicine, The University of Sydney

***Living in a Dangerous World: How Or Immune System Copes with Infections***  
***Harnessing the Immune System: The Power of Immunisation***

RE Collins, Director, the Science Foundation for Physics and Head of the Department of Applied Physics, School of Physics, The University of Sydney

***The Nature of Energy***  
***The Importance of Energy***

G Pearman, Chief, CSIRO Division of Atmospheric Research

***The Changing Composition of the Atmosphere***  
***The Greenhouse Effect***

L Poladian, Australian Research Council Senior Research Fellow, Optical Fibre Technology Centre, The University of Sydney

***New Waves in Communication***  
***Terabits, Solitons and Quantum Secrets: The Future of Communications***

E Sadler, Australian Research Council Senior Research Fellow, School of Physics, The University of Sydney

***Life in the Galaxy – Is Anyone Out There?***  
***The Far Horizon – Astronomy in the New Millennium***

G Sutherland, Department of Cytogenetics and Molecular Genetics, Women's and Children's Hospital, Adelaide

***The Human Genome Project***

G Sutherland, Department of Cytogenetics and Molecular Genetics, Women's and Children's Hospital, Adelaide, and J Nicholls, Executive Officer, The Science Foundation for Physics, and Senior Research Fellow, Special Research Centre for Theoretical Astrophysics, School of Physics, The University of Sydney

***Human Molecular Genetics***



# ISS1997: Light

## The International Science School Archives



### Participants

137 (72 boys; 65 girls)

### Convenors

JA Nicholls, RE Collins

### Lecturers

RE Collins, Director, the Science Foundation for Physics and Head of the Department of Applied Physics, School of Physics, The University of Sydney

***The Nature of Light***

***Light – Particles or Waves?***

M Corby, Social Work Undergraduate, The University of Sydney

***What it Means to be Blind***

L Cram, Professor of Physics (Astrophysics), The School of Physics, The University of Sydney

***The History of Light***

***Doppler Effects in Astronomy***

J Dawes, Senior Lecturer, Macquarie University and J Piper, Professor of Physics, Director of the Commonwealth Special Research Centre for Lasers and Applications, Macquarie University

***Lasers: Their Development and Characteristics***

H Gleeson, Senior Lecturer, University of Manchester, UK

***New IMAGES I: Liquid Crystal Displays: How to Manipulate Light with Molecules***

***New IMAGES II: Interference in Nature: The Twist in the Tail***

P Krug, Senior Research Scientist, Optical Fibre Technology Centre, The University of Sydney

***Optical Communications: Meeting the Challenges***

A Larkum, Professor of Plant Sciences, School of Biological Sciences, The University of Sydney

***Photosynthetic Reaction Centres – The Engine of Life***

***Nature's Light Harvesting Kaleidoscope***

D Malin, Photographic Scientist, Anglo-Australian Observatory, Adjunct Professor of Scientific Photography, RMIT

***Cloud and Light in Astronomy***

***Photography and the Birth of Astrophysics***

P Robinson, Reader, The School of Physics, The University of Sydney

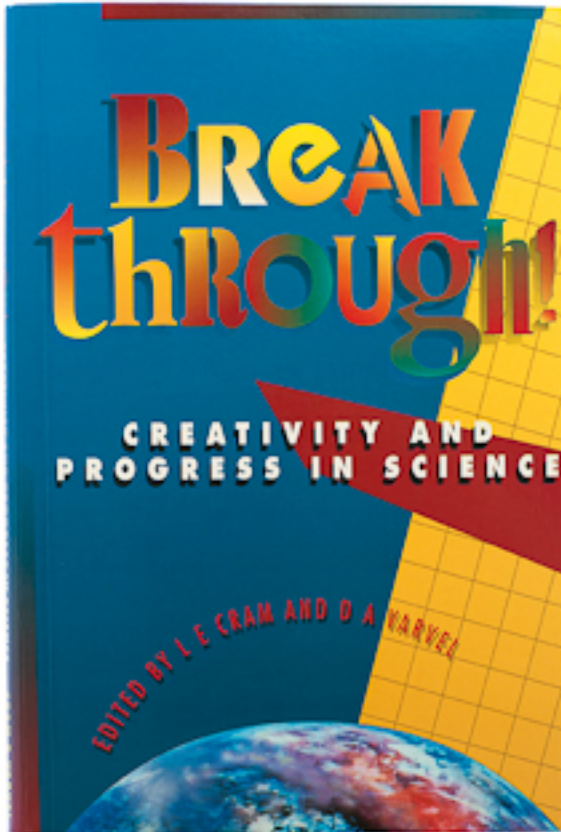
***Light and Relativity***





# ISS1995: Breakthrough! Creativity and Progress in Science

The International Science School Archives



## Participants

153 (108 boys; 45 girls)

## Convenors

LE Cram, DA Varvel

## Lecturers

CJ Cogswell, Senior Lecturer, The School of Physics, The University of Sydney  
*Optical Microscopy: Revealing the Design of the Microscopic World*

L Cram, Director, The Science Foundation for Physics and Head of the School of Physics, The University of Sydney

**Michael Faraday 1791–1867: A Genius of his Time**

H Garnett, Executive Director, Australian Nuclear Science and Technology Organisation

***Hunting Invisible Organisms: The Role of Microscopy in the Development of Microbiology***

H Given, Executive Director, Project IDA, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California, San Diego, USA

***Topics in Global Seismology in 1995***

M Gore, Director, QUESTACON – The National Science and Technology Centre, Canberra

***The Invention of the Telescope***

***Discoveries with the Telescope from 1600 to 1900***

Dr Karl Kruszelnicki, Julius Sumner Miller Fellow, The School of Physics, The University of Sydney

***Absolutely Fabulous Breakthroughs!***

MS Longair, Jacksonian Professor of Natural Philosophy, University of Cambridge, UK

***Technological Advance and Astronomical Discovery: Optical Astronomy – From Tycho Brahe to the Hubble Space Telescope***

***Technological Advance and Astronomical Discovery: The Opening up of the Electromagnetic Spectrum – The New Astronomies***

L Peak, Head of the Falkiner Department of High Energy Physics, The University of Sydney

***Probing the Heart of Matter Part 1 – An Introduction to Accelerators***

***Probing the Heart of Matter Part 2 – The World of Subatomic Particles***

D Ridley, Associate Professor of Organic Chemistry, The University of Sydney

***Nuclear Magnetic Resonance: The Discovery – Some Nuclei Spin!***

***Nuclear Magnetic Resonance: From Spectrum to Molecular Structure***

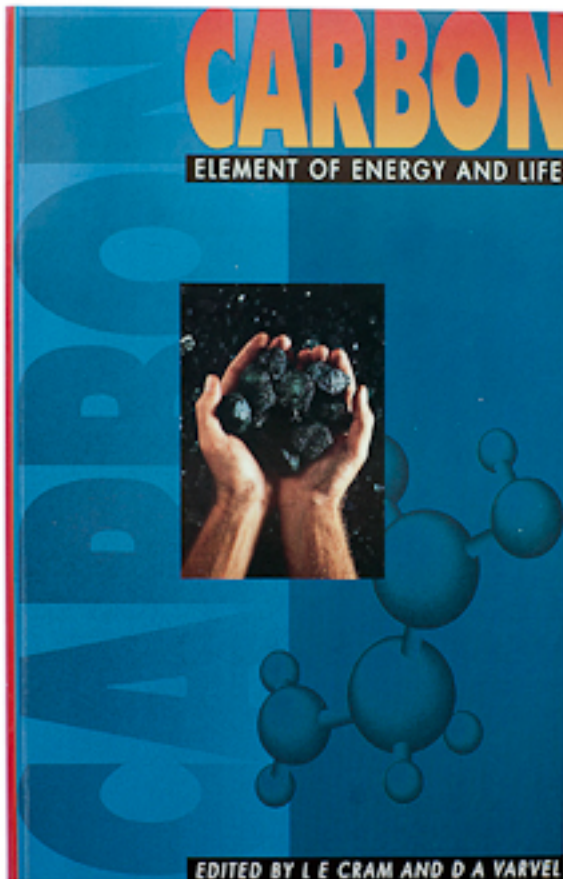
***Nuclear Magnetic Resonance: It is all a Matter of Timing!***

P Robinson, Senior Lecturer, The School of Physics, The University of Sydney

***Laser Tests of Quantum Physics***

# ISS1993: Carbon - Element of Energy and Life

The International Science School Archives



## Participants

132 (60 boys; 72 girls)

## Convenors

LE Cram, DA Varvel

## Lecturers

D Allen, Research Astronomer, Anglo-Australian Observatory, Epping, NSW  
***Carbon in Space***

MC Ball, Fellow, Research School of Biological Sciences, the Australian National University, Canberra



***The Carbon Cycle: Response of Plants to Carbon Dioxide***

***Life: Coping with Light***

***Life: Coping with Cold***

M Barbetti, Director, the NWG Macintosh Centre for Quaternary Dating, The University of Sydney

***Radiocarbon Dating***

D Cockayne, Director, Electron Microscope Unit, The University of Sydney

***Structure of Carbon Materials I: Exploring the Structure of Matter***

***Structure of Carbon Materials II: The Carbon Siblings***

RE Collins, Head of the Department of Applied Physics, School of Physics, The University of Sydney

***Energy***

T Gold, Professor Emeritus, Cornell University, USA

***The Outgassing Processes of the Earth: The Origin of Natural Gas and Oil***

RT Haworth, Director-General, Geophysics Marine and Sedimentary Geoscience Branch, Geological Survey of Canada

***Oil and Gas***

***Coal***

***Methane***

MS Longair, Jacksonian Professor of Natural Philosophy, University of Cambridge, UK

***The Origin of Chemical Elements: The Case for the Hot Big Bang and Cosmological Nucleosynthesis***

***The Origin of Chemical Elements: Element Formation and the Origin of Galaxies***

D Ridley, Associate Professor of Organic Chemistry and Pro-Dean of the Faculty of Science, The University of Sydney

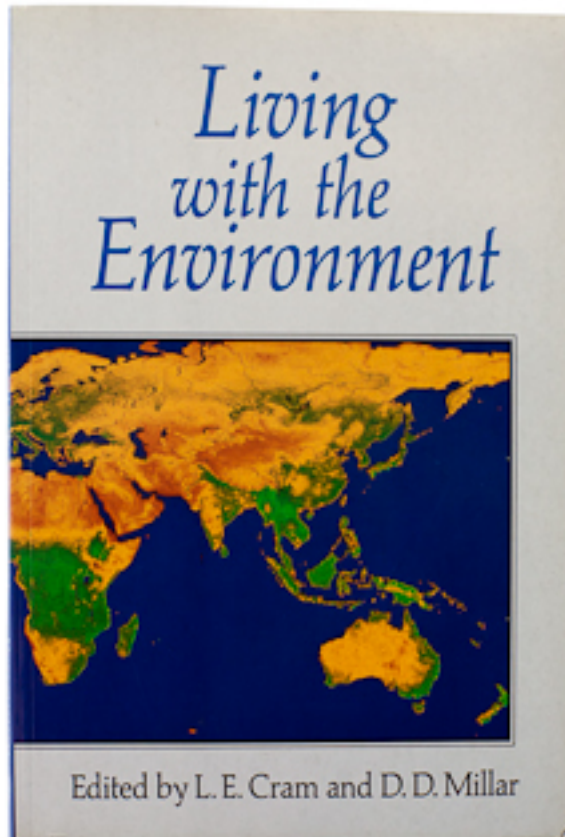
***Carbon Comes to Life I: Carbon: The Key Element***

***Carbon Comes to Life II: The Molecules of Life***

***Carbon Comes to Life III: Different Substances for Different Tasks***

# ISS1991: Living with the Environment

The International Science School Archives



## Participants

131 (61 boys; 71 girls)

## Convenors

LE Cram, DD Millar

## Lecturers

MC Ball, Fellow, Research School of Biological Sciences, the Australian National University, Canberra

***Strategies of Carbon Gain and Water Use in Higher Plants***  
***Coping with Extreme Light Environments***

RE Collins, Professor of Applied Physics, School of Physics The University of Sydney

## **Energy**

GP Harris, Director, CSIRO Office of Space Science and Applications, Canberra

***Monitoring the Earth from Space***

***Climate Change and Marine Ecosystems: Some Australian Case Studies***

AB McBratney, School of Crop Sciences, The University of Sydney

***Environmental Changes and the Soil***

RM May, Professor, Department of Zoology, University of Oxford, UK

***How Many Species Are There on Earth Today?***

***And How Many Species Tomorrow?***

***Managing the Ark***

GI Pearman, CSIRO Division of Atmospheric Research, Melbourne

***The Changing Chemical Composition of the Atmosphere***

***Understanding and Predicting the Behaviour of Global Climate***

RV Short, Department of Anatomy and Physiology, Monash University

***Human Population Growth***

BG Thom, Professor of Geography, Pro-Vice-Chancellor, The University of Sydney

***Sea Level Changes***

M Westoby, School of Biological Sciences, Macquarie University

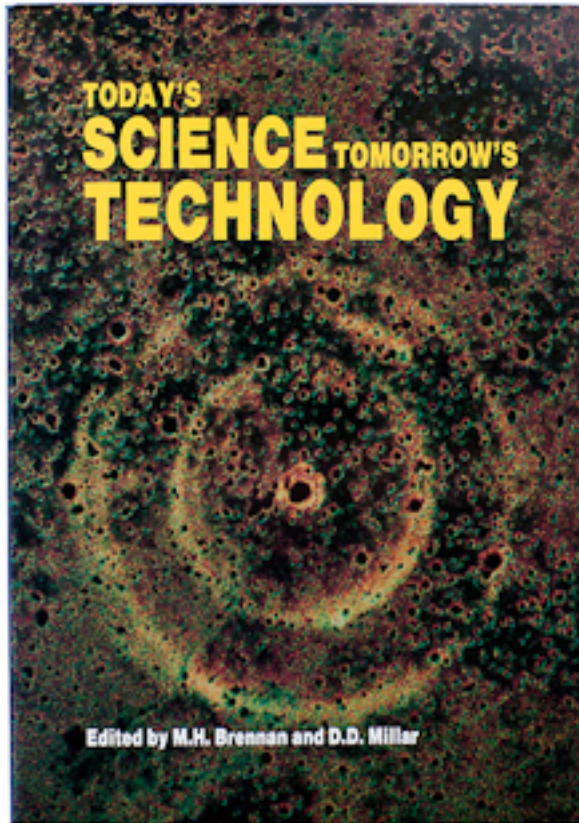
***Road Maps for Predator-prey Interactions***

***Making Biotechnology Effective under Field Conditions***

***Embryos with Packed Lunches***

# ISS1989: Today's Science, Tomorrow's Technology

The International Science School Archives



## Participants

127 (69 boys; 58 girls)

## Convenors

MH Brennan, DD Millar

## Lecturers

EA Ash, Rector, Imperial College, Science, Technology and Medicine, London, UK  
*The Philosopher's Stone – Semiconductors*  
*Nuclear Energy and the Perception of Risk*

AE Clarke, Plant Cell Biology Research Centre, School of Botany, University of



Melbourne

***Engineering Plants Using Recombinant DNA Technology***

LE Cram, Professor of Physics (Astrophysics), School of Physics, The University of Sydney

***Images of the Radio Sky***

RA Gross, Dean, Applied Physics and Engineering, Columbia University, New York

***High Temperature Physics and Fusion***

BJ Grosz, Gordon McKay Professor of Computer Science, Aiken Computation Laboratory, Harvard University, USA

***Machine Intelligence***

D Malin, Anglo-Australian Observatory, Epping, NSW

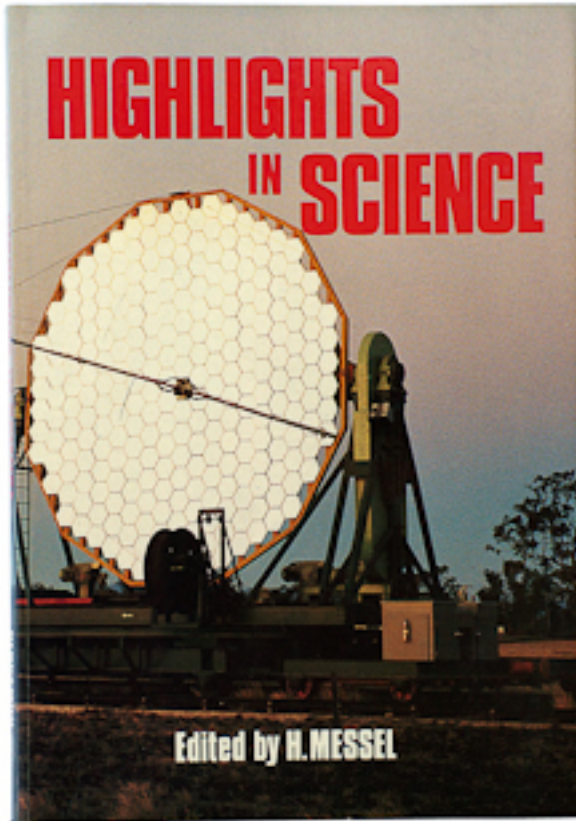
***Astronomical Photography under the Microscope***

JM Thomas, Director, The Royal Institution of Great Britain, UK

***The Chemist as the Architect of New Technologies  
Probing the Internal and Surface Structure of Solids  
Crystals Replete with Channels, Gages and Cavities  
Catalysts for Today and Tomorrow***

# ISS1987: Highlights in Science

The International Science School Archives



## Participants

126 (70 boys; 56 girls)

## Convenors

H Messel

## Lecturers

W Bodmer, Director of Research, Imperial Cancer Research Fund Laboratories,  
London, UK

***Genes, DNA and Genetic Engineering***

***Tissue Types, Transplantation and Disease***

***Genetics and Cancer***

***When will Pigs have Wings?***

R Hanbury Brown, School of Physics, The University of Sydney

***Photons, Stars and Uncommon Sense***

T Gold, Professor of Astronomy, Cornell University New York; Director of the Cornell University Center for Radiophysics and Space Research, **USA**

***The Theory of Hearing***

***Pulsars***

***Moon***

***The Origin of Natural Gas and Petroleum***

RM May, Professor of Biology, Department of Biology, Princeton University, USA

***Biological Populations and Deterministic Models with Apparently Random Dynamics***

***The Role of History in Biology: Stochastic Models with Apparently Deterministic Dynamics***

***Voting Paradoxes, Prisoner's Dilemmas and Other Games Animals Play***

***How Many Species?***

H Messel, Head of the School of Physics, Director of the Science Foundation for Physics, The University of Sydney

***Science – What Is It?***

G Nossal, Director, Walter and Eliza Hall Institute of Medical Research, Royal Melbourne Hospital

***Strategies of Natural Defence Against Infections***

***Vaccines as History's Most Cost-effective Public Health Tools***

D Phillips, Deputy Director, The Royal Institution of Great Britain, UK

***Lasers***

***Lasers and Spectroscopy***

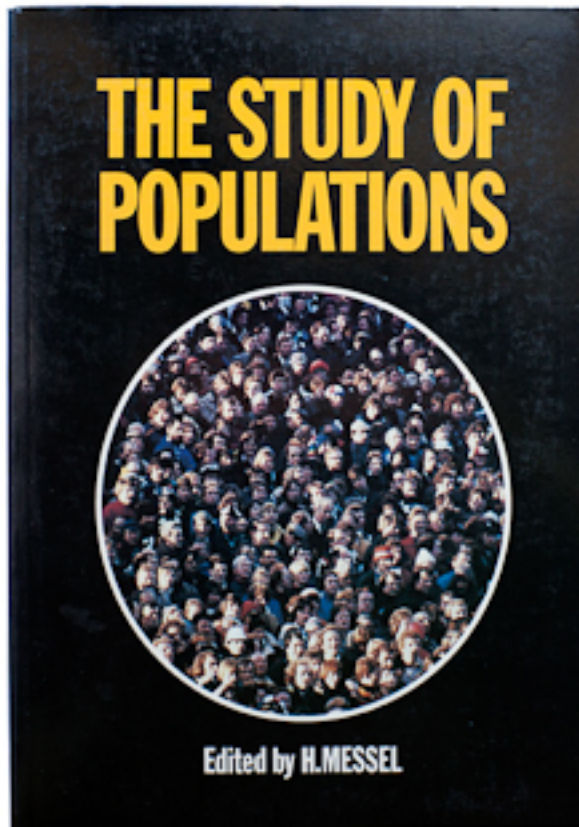
***Nanoseconds to Femtoseconds***

***A Little Light Relief (Light and Lasers in Medicine)***



# ISS1985: The Study of Populations

The International Science School Archives



## Participants

130 (71 boys; 59 girls)

## Convenors

H Messel

## Lecturers

J Bannister, Director of the Western Australian Museum, Chairman of the Scientific Committee of the International Whaling Commission's Protected Species Subcommittee

***Sustainable Harvesting of Whale Populations 1: Theory and Background***  
***Sustainable Harvesting of Whale Populations 2: Putting it into Practice***

G Caughley, Senior Principal Research Scientist, Division of Wildlife and



Rangelands Research, CSIRO  
***Problems in Wildlife Management***

TE Lovejoy, Executive Vice-President (Science), World Wildlife Fund, Washington DC, USA

***Biosphere Dynamics or Biological Diversity in Peril***  
***The Value of Biodiversity***  
***Protecting Biological Diversity***  
***Forest Fragmentation in the Amazon: A Case Study***

RM May, Class of 1877 Professor of Zoology, Princeton University, USA

***Population Dynamics: Introduction***  
***Population Dynamics: Single Populations***  
***Population Dynamics: Interactions Between Species***  
***Population Dynamics: Communities***

J Menken, Professor of Sociology and Public Affairs, Assistant Director, Office of Population Research, Princeton University

***Human Population Growth in Historical Perspective***  
***Fertility Patterns and Population Change***  
***Mortality and Migration and Their Effects on Population Size and Distribution***  
***Population Problems of Developing Countries and Efforts to Alleviate Their Impact***

H Messel, Head of the School of Physics, Director of the Science Foundation for Physics, The University of Sydney

***The Scholastic Crocodile***

J Sumner Miller, Emeritus Professor of Physics, El Camino College, California, USA  
***So You Want to be a Scientist***

RV Short, Professor of Physiology, Department of Physiology, Monash University  
***Reproductive Patterns in Man and the Great Apes***  
***Contraceptive Research and Development***

# ISS1983: Science Update

The International Science School Archives



## Participants

118 (67 boys; 51 girls)

## Convenors

H Messel

## Lecturers

WF Bodmer, Director of Research, Imperial Cancer Research Fund Laboratories,  
London, UK

***Molecular Genetics***

***Genetic Engineering***

***Tissue Typing and Immune Response: The HLA System***

***Genes, Viruses and Cancer***

H Bondi, Chairman, Natural Environment Research Council, Swindon, England

***Gravitation: Is it a Force?***

***How Dark is the Universe?***

***Who Needs the World's Energy?***

***New Views of the Ocean***

MH Brennan, Head of the Wills Plasma Physics Department, School of Physics, The University of Sydney

***Nuclear Fusion—Energy Source of the Future***

***The Tokamak Reactor***

***Some Alternative Fusion Reactor Concepts***

RE Collins, Professor of Applied Physics, School of Physics, The University of Sydney

***Solar Energy – Fact***

***Solar Energy – Future or Fantasy***

R Hanbury Brown, President of the International Astronomical Union, School of Physics, The University of Sydney

***Astronomy in Space***

RW Hunstead, Senior Lecturer, School of Physics, The University of Sydney

***Beyond the Milky Way – Radio Galaxies and Quasars***

MI Large, Reader, School of Physics, The University of Sydney

***Pulsars: Beacons in the Milky Way***

CBA McCusker, Head of the Falkiner High Energy Nuclear Physics Department, School of Physics, The University of Sydney

***The Search for Particles***

***The Fundamental Nature of Matter***

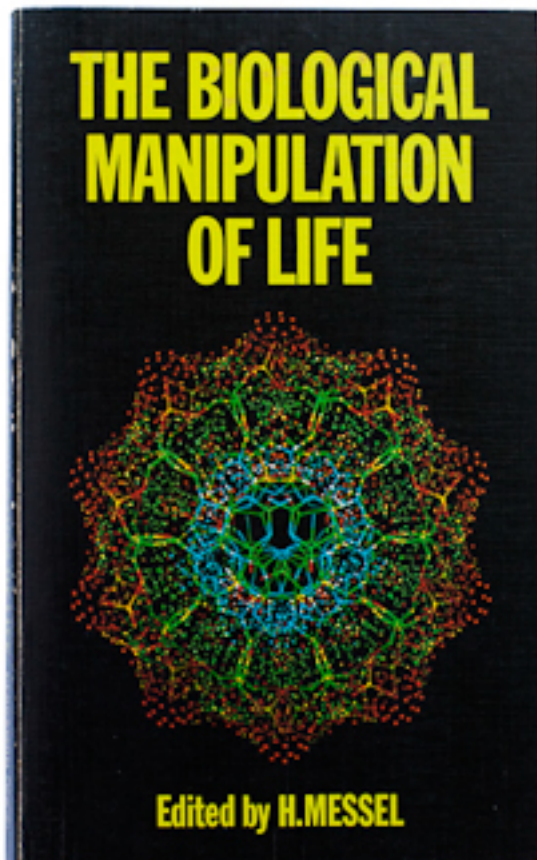
BY Mills, Head of the Astrophysics Department, School of Physics, The University of Sydney

***Our Galaxy***



# ISS1981: Biological Manipulation of Life

The International Science School Archives



## Participants

115 (50 boys; 65 girls)

## Convenors

ST Butler and H Messel

## Lecturers

WF Bodmer, Director of Research, Imperial Cancer Research Laboratories, London, UK

*HLA—The Major Human Tissue Typing System*

*The Genetic and Cellular Basis for Cancer*

*Implications of Advances in Genetics for the Future*

KD Brown, School of Biological Sciences, The University of Sydney  
***Anatomy of a Bacterial Chromosome***

DM Danks, Professor of Paediatrics, Department of Paediatrics, Royal Children's Hospital, Melbourne  
***Diagnosis and Therapy of Genetic Disease***

O Frankel, CSIRO Division of Plant Industry, Black Mountain, Canberra  
***Conservation of Genes, Gene Banks and Patients***

JW Goding, Walter and Eliza Hall Institute of Medical Research, Royal Melbourne Hospital  
***The Impact of Recombinant DNA on Understanding the Immune Response***

CB Kerr, Professor of Preventive and Social Medicine, Commonwealth Institute of Health, The University of Sydney  
***Negative and Positive Eugenics I: A Chequered History; Utopian Ideas with Dangerous Consequences***  
***Negative and Positive Eugenics II: New Concepts of Human Quality Control***

J Langridge, CSIRO Division of Plant Industry, Black Mountain, Canberra  
***Genetic Transformation in Higher Animals***  
***Recombinant DNA in Evolution***

WJ Peacock, Chief of the CSIRO Division of Plant Industry, Black Mountain, Canberra  
***The Rise of Molecular Biology and Gene Manipulation***  
***Anatomy of the Drosophila Chromosome***

AJ Pittard, Professor of Microbiology, Department of Microbiology, University of Melbourne  
***Nature's Manipulation of DNA: Jumping Genes***  
***The Recombinant DNA Debate: Social and Ethical Issues***

WR Scowcroft, CSIRO Division of Plant Industry, Black Mountain, Canberra  
***Cellular and Molecular Plant Breeding***

J Shine, Research School of Biological Sciences, Australian National University, Canberra  
***Recombinant DNA Technology***  
***Cloning of Hormone Genes***

RH Symons, Department of Biochemistry, The University of Adelaide  
***Structure and Replication of DNA***  
***The Genetic Code and Protein Synthesis***

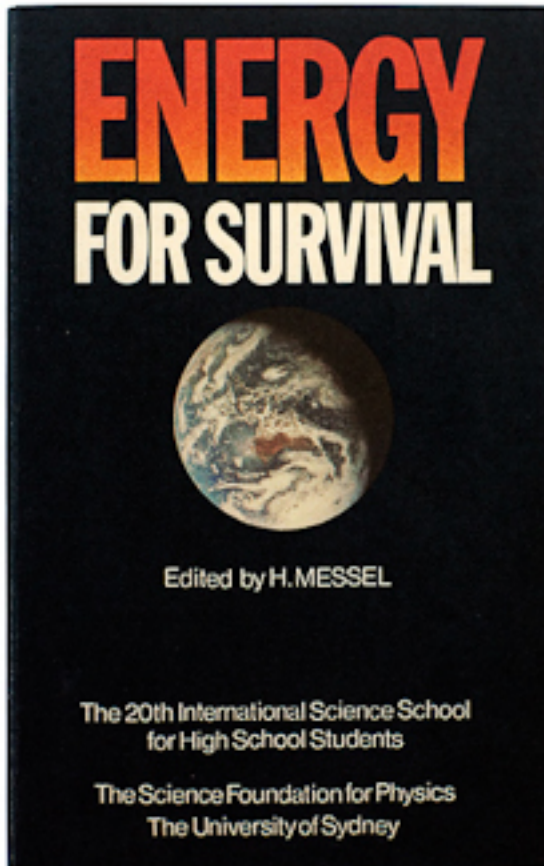




*Scholars accommodated at the Cranbrook School*

# ISS1979: Energy for Survival

The: International Science School Archives



## Participants

115 (63 boys; 52 girls)

## Convenors

ST Butler and H Messel

## Lecturers

LC Birch, School of Biological Sciences, The University of Sydney  
***Zero Energy Growth***

H Bondi, Chief Scientist, Department of Energy, London, UK  
***World Energy Demand***  
***World Energy Supply***  
***Hydro, Wind, Wave, Tidal and Geothermal Power***

## **Energy Storage**

RN Bracewell, Radio Astronomy Institute of the Radioscience Laboratory, Stanford University, California, USA

***How It All Began***

***Man, the Lazy Animal***

***Electricity from Sunlight***

T Gold, Director, Center for Radiophysics and Space Research, Cornell University, Ithaca, New York, USA

***The Earthquake Evidence for Earth Gas***

***The Supply of Natural Fuels***

RA Gross, Department of Mechanical and Nuclear Engineering, Columbia University, New York, USA

***The Potential of Nuclear Energy***

***The Nuclear Fuel cycle***

***Fusion***

JB Kirkwood, Commissioner, Western Australian State Energy Commission, Perth, WA

***The Risk of Not Developing Energy***

***Coal: Black and Brown***

W Leonard, Chairman, Ampol Petroleum Limited, Sydney, Australia

***Oil and Gas: I***

***Oil and Gas: II***

CBA McCusker, Head of the Falkiner Nuclear Department, School of Physics, The University of Sydney

***Physics and Mankind: The Past Fifty Years***

DJ Nicklin, Head of the Department of Chemical Engineering, University of Queensland

***Liquid and Gaseous Fuels from Coal***

MG Pitman, Head of the School of Biological Sciences, The University of Sydney

***Bioconversion***

B Window, Solar Energy Group, School of Physics, The University of Sydney

***Solar Power: Thermal Energy Source of the Future***



# ISS1977: Australian Animals and Their Environment

The International Science School Archives



## Participants

104 (54 boys; 50 girls)

## Convenors

ST Butler and H Messel

## Lecturers

SD Bradshaw, Professor of Zoology and Head of the Department Zoology, The University of Western Australia

*Reptiles and Their Adaptation to Arid Environments*

*The Regulation of Water and Electrolyte Balance in Desert Lizards*



TJ Dawson, Professor of Zoology, School of Zoology, University of NSW  
***Evolutionary History of the Australian Fauna***  
***Energy and Temperature Relationships of Marsupials with some comments on Monotremes***  
***Kangaroos: Advanced Mammals***

B Green, Senior Research Scientist, Division of Wildlife Research, CSIRO, Lyneham, Canberra, P Catling, Experimental Officer, Division of Wildlife Research, CSIRO, Lyneham, Canberra  
***The Biology of the Dingo***

GC Grigg, Senior Lecturer in Biology, School of Biological Sciences, The University of Sydney  
***Ionic and Osmotic Regulation in the Estuary***  
***The Body Temperature of Crocodiles and Dinosaurs***

H Heatwole, Associate Professor, Department of Zoology, the University of New England, Armidale, NSW  
***The Consequences of Leglessness***  
***Adaptations of Sea Snakes***

H Messel, Professor of Physics and Head of the School of Physics, The University of Sydney  
***A Study of *Crocodylus porosus* in Northern Australia: The Crocodile Programme in Northern Australia***

AE Newsome, Division of Wildlife Research, CSIRO, Lyneham, Canberra  
***The Red Kangaroo – An Example of Biological Indicators of environmental Change***

GB Sharman, Professor of Biology, School of Biological Sciences, Macquarie University NSW  
***Sex Determination and X Chromosome Inactivation in Marsupials***

CH Tyndale-Biscoe, Division of Wildlife Research, CSIRO, Lyneham, Canberra  
***Environment and Control of Breeding in Kangaroos and Wallabies***  
***Marsupial Reproduction – An Alternate Strategy***

GJW Webb, Professional Officer, Environmental Physics Department, School of Physics, The University of Sydney  
***The Natural History of *Crocodylus Porosus*: Habitat and Nesting; Growth, Movement, River Distributions and General Comments***

MJ Yerbury, Lecturer and Head of Telemetry Group, Environmental Physics Department, School of Physics, The University of Sydney  
***Telemetry and Crocodiles***



# ISS1975: Our Earth

## The International Science School Archives



### Participants

119 (76 boys; 43 girls)

### Convenors

ST Butler and H Messel

### Lecturers

SW Carey, Professor of Geology, University of Tasmania

*The Face of the Earth*

*The Necessity of Expansion*

*The Subduction Myth*

AA Day, Senior Lecturer, Department of Geology and Geophysics, The University of Sydney

***The Interior of the Earth***

DA Falvey, Lecturer, Department of Geology and Geophysics, The University of Sydney

***Geomagnetism***

T Gold, Professor of Astronomy and Director, Center for Radiophysics and Space Research, Cornell University, Ithaca, New York, USA

***The Origin of Terrestrial Planets***

***The Earth and the Moon***

***The Planets Inside the Earth's Orbit***

***The Most Tantalising of the Planets: Mars***

EC Leitch, Lecturer, Department of Geology and Geophysics, The University of Sydney

***Chemical Composition of the Solid Earth***

NWG Macintosh, Emeritus Professor, Department of Anatomy, The University of Sydney

***The Evolution of Man and Ape***

GM Philip, Professor of Geology and Head of the Department of Geology and Geophysics, The University of Sydney

***Time and its Measurement***

***The Atmosphere and Evolution***

***The Origin of Life***

JT Wilson, Professor of Geophysics and Director General of the Ontario Science Centre, Don Mills, Ontario, Canada

***The Development of Continental Drift and Plate Tectonics***

***The Lifecycle of Ocean Basins: Stages of Growth***

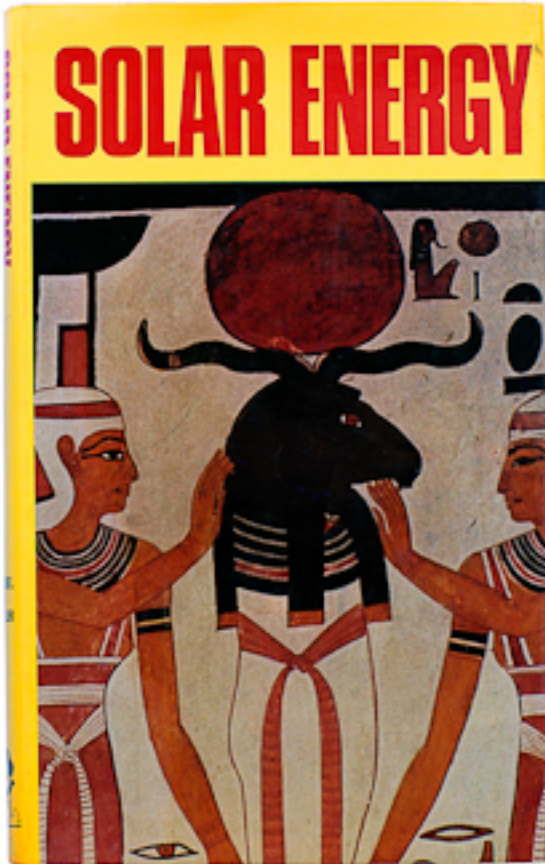
***The Lifecycle of Ocean Basins: Stages of Decline***

***Pre-Mesozoic Drift***

***Possible Mechanisms and the Nature of Plate Motion***

# ISS1974: Solar Energy

The International Science School Archives



## Participants

123 (90 boys; 33 girls)

## Convenors

ST Butler and H Messel

## Lecturers

NK Boardman, Chief Research Scientist, Division of Plant Industry, CSIRO, Canberra

AWD Larkum, Senior Lecturer, School of Biological Sciences, The University of Sydney

***Biological Conversion of Solar Energy***

JO'M Bockris, School of Physical Sciences, Flinders University of South Australia



## **Batteries**

LW Davies, Chief Scientist, Amalgamated Wireless (Australasia) Limited, North Ryde

### ***Direct Solar Production of Electricity***

DW George, Professor of Mechanical Engineering, The University of Sydney

### ***Heat Transfer and Storage***

RG Giovanelli, Chief of the Division of Physics, CSIRO, Sydney

### ***The Nature of Solar Energy Optical Magnification of Solar Radiation***

JL Luck, Walker-Ames Distinguished Professor, Los Alamos Scientific Laboratory, Los Alamos, New Mexico, USA

### ***World Energy Resources and Consumption***

RN Morse, Director of Solar Energy Studies, CSIRO, East Melbourne

### ***Thermal Conversion and Solar Devices Today***

GI Pearman, Division of Atmospheric Physics, CSIRO, Victoria

### ***Energy Conversion, the Atmospheric Environment and Climatic change***

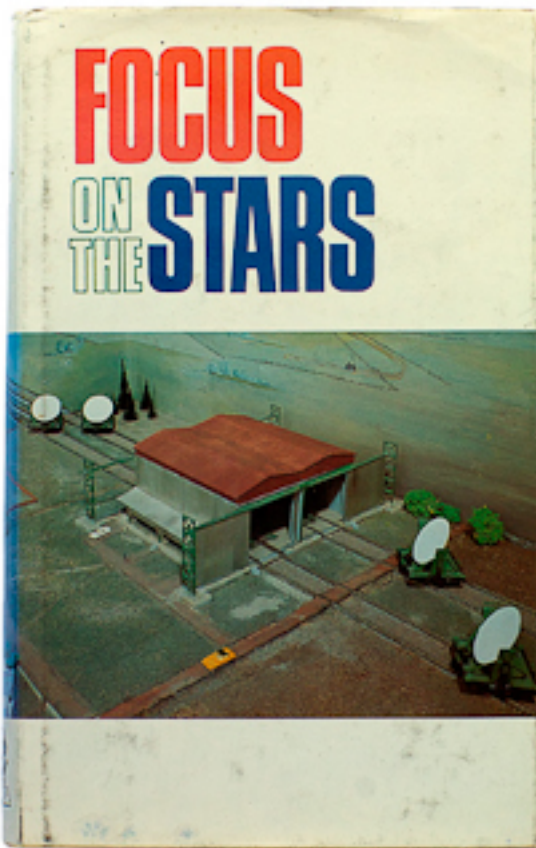
CN Watson-Munro, Professor of Physics and Head of the Wills Plasma Physics Department, School of Physics, The University of Sydney, CM Horwitz, School of Physics, The University of Sydney

### ***Selective Surfaces***



# ISS1973: Focus on the Stars

The International Science School Archives



## Participants

122 (93 boys; 29 girls)

## Convenors

ST Butler and H Messel

## Lecturers



Dr Margaret Burbidge

BJ Bok, Professor of Astronomy, University of Arizona, USA  
***Probing Our Galaxy***

RD Brown, Chairman, Department of Chemistry, Monash University, Victoria  
***Molecules in Space – Galactochemistry***

FD Drake, Professor of Astronomy and Associate Director of the Center for Radiophysics and Space Research, Cornell University, Ithaca, New York, USA  
***The Radio Search for Intelligent Extraterrestrial Life***

P Goldreich, Professor of Planetary Science and Astronomy, California Institute of Technology, USA  
***The Evolution of the Universe***

R Hanbury Brown, Head of the Chatterton Astronomy Department, School of Physics, The University of Sydney  
***A New Look at the Stars***

CE Sagan, Director, Laboratory for Planetary Studies and Professor of Astronomy and Space Sciences, Center for Radiophysics and Space Research, Cornell University, Ithaca, NY, USA  
***Mars – The View for Mariner 9***

JP Wild, Chief of the Division of Radiophysics, Commonwealth Scientific and Industrial Research Organisation, Sydney  
***The Sun***



# ISS1972: Brain Mechanisms and the Control of Behaviour

The International Science School Archives



## Participants

123 (95 boys; 28 girls)

## Convenors

ST Butler and H Messel

## Lecturers

WR Adey, Professor of Anatomy and Physiology, University of California, USA,  
DB Lindsley, Professor of Psychology, University of California, USA  
J Olds, Professor of Biology, California Institute of Technology, USA  
***Brain Mechanisms and the Control of Behaviour***



LC Birch, Professor of Biology, The University of Sydney  
***Biology and the Image of Man***

J Maddox, Editor, Nature, London, UK  
***Problems of Predicting Population***

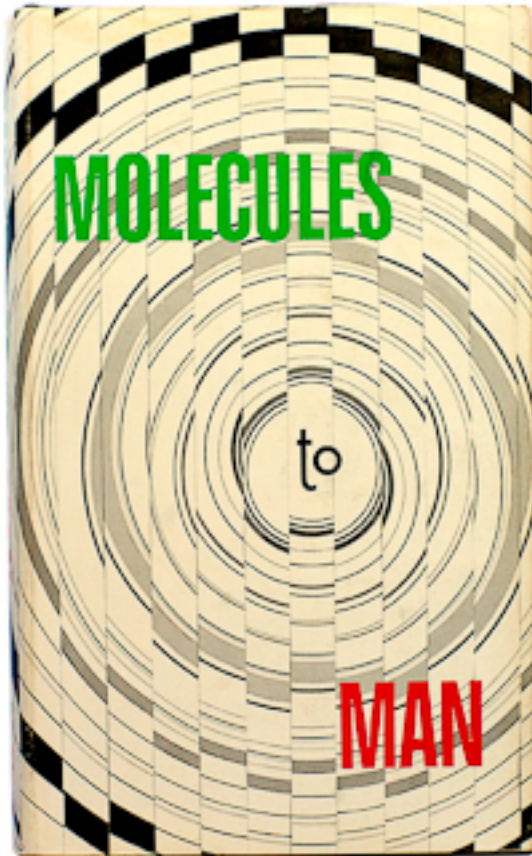
RM May, Professor of Physics, The University of Sydney  
***Terrestrial Ecology Systems***

WM O'Neil, Emeritus Professor, The University of Sydney  
***Brain and Mind***



# ISS1971: Molecules to Man

The International Science School Archives



## Participants

122 (87 boys; 35 girls)

## Convenors

H Messel and ST Butler

## Lecturers

PR Ehrlich, Professor of Biology, Stanford University, California, USA  
*Population Resources and Environment*

RJ Harrison, Professor of Anatomy, University of Cambridge, UK  
*Dolphins and Man*

GJV Nossal, Director, Walter and Eliza Hall Institute of Medical Research,  
Melbourne

***Immunity in a Modern Setting***

G Porter, Director, The Royal Institution, London, UK

***Molecules to Man***

DC Phillips, Professor of Molecular Biophysics, Oxford University, UK

***Nucleic Acids***

Chapman Pincher, Science Editor, Daily Express, London, UK

***The Interaction of Science with Society with Special Reference to the Media***



# ISS1970: Pioneering in Outer Space

## The International Science School Archives



### Participants

132 (99 boys; 33 girls)

### Convenors

H Messel and ST Butler

### Lecturers

H Bondi, Professor of Applied Mathematics, King's College, London, UK and  
Director-General of the European Space Research Organisation

***Europe's Space Effort***  
***Gravitation***

G Hage, Vice-President for Development, Boeing Company, Seattle, Washington,  
USA, LB James, Director of Lunar Operations, George C Marshall Space Flight  
Center, Huntsville, Alabama, USA, GE Mueller, Vice-President, General Dynamics

Corporation, Washington DC, USA  
***US Space Flight***

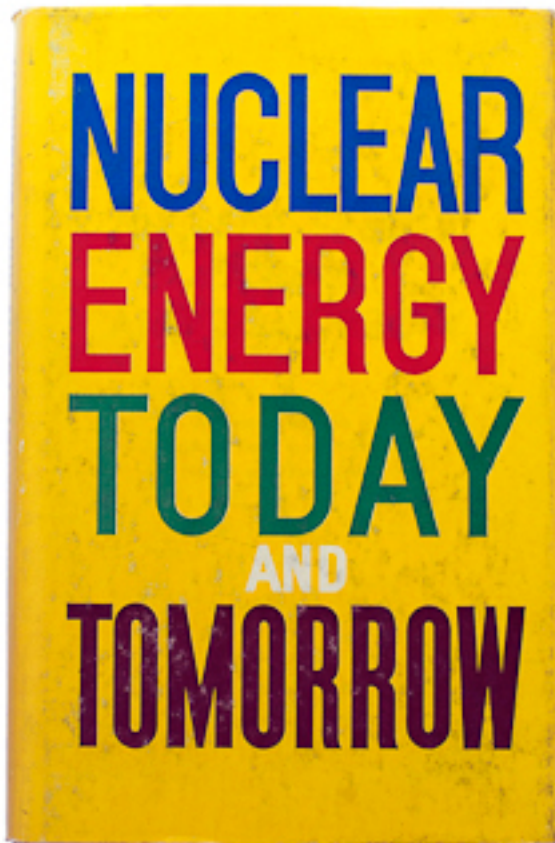
Sir Mark Oliphant, Emeritus Professor, Fellow of the Australian National University,  
Canberra  
***Science and Mankind***





# ISS1969: Nuclear Energy Today and Tomorrow

The International Science School Archives



## Participants

139 (118 boys; 21 girls)

## Convenors

ST Butler and H Messel

## Lecturers

CBA McCusker, Professor of High Energy Nuclear Physics, The University of Sydney

*Cosmic Radiation*

PW McDaniel, Director of Research, US Atomic Energy Commission, Washington

DC, USA

***The Peaceful Uses of the Atom***

WKH Panofsky, Director, Stanford Linear Accelerator Center, Stanford University, USA, and RH Dalitz, Professor of Theoretical Physics, Oxford University, UK

***Particle Physics***

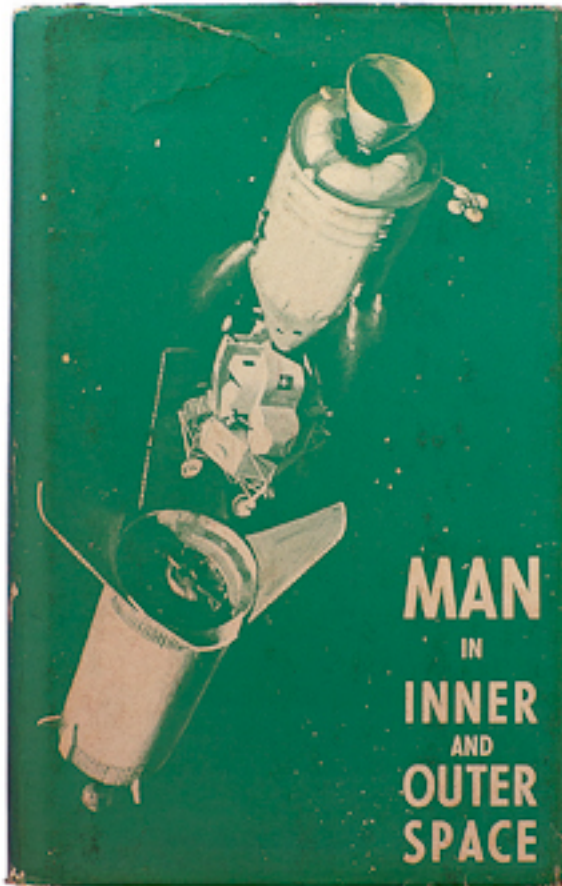
DZ Robinson, Vice-President of Academic Affairs, New York University, New York, USA

***Science and Society***



# ISS1968: Man in Inner and Outer Space

The International Science School Archives



## Participants

129 (109 boys; 20 girls)

## Convenors

ST Butler and H Messel

## Lecturers

RN Bracewell, Professor of Electrical Engineering, Stanford University, California, USA

*The Sun*

GJF MacDonald, Executive Vice-President, Institute for Defense Analyses, Washington DC, USA

*Science and Technology of the Environment*

RM May, Reader in Physics, School of Physics, The University of Sydney  
***The Timescale of Creation***

EFM Rees, Deputy-Director, Technical, NASA George C Marshall Space Flight Center, Huntsville Alabama; Director, Apollo Special Task Team at NR, NASA Manned Spacecraft Center, Downey, California, USA  
***Introduction to Space Flight – Part I***

DK Slayton, AB Shepard, LG Cooper, NASA Astronauts  
***Introduction to Space Flight – Part 2***



*Scholars from Japan, UK and US on steps of White House with Mrs Lyndon Johnson.*

# ISS1967: Apollo and The Universe

The International Science School Archives



## Participants

158 (101 boys; 57 girls)

## Convenors

ST Butler and H Messel

## Lecturers

H Bondi, Professor of Applied Mathematics, King's College, University of London, UK

***Gravitation and the Universe***

T Gold, Professor of Astronomy, Cornell University New York; Director of the Cornell University Center for Radiophysics and Space Research, USA

***Radio-astronomy***



G Mueller, Associate Administrator for Manned Space Flights, NASA, Washington DC, USA

***Space Rocketry and a Man on the Moon***

EE Salpeter, Professor of Theoretical Physics, Cornell University, Ithaca, New York, USA

***The Evolution of Stars and the Origin of the Elements***

GT Seaborg, Chairman, US Atomic energy Commission, Washington DC, USA

***The Transuranium Elements***

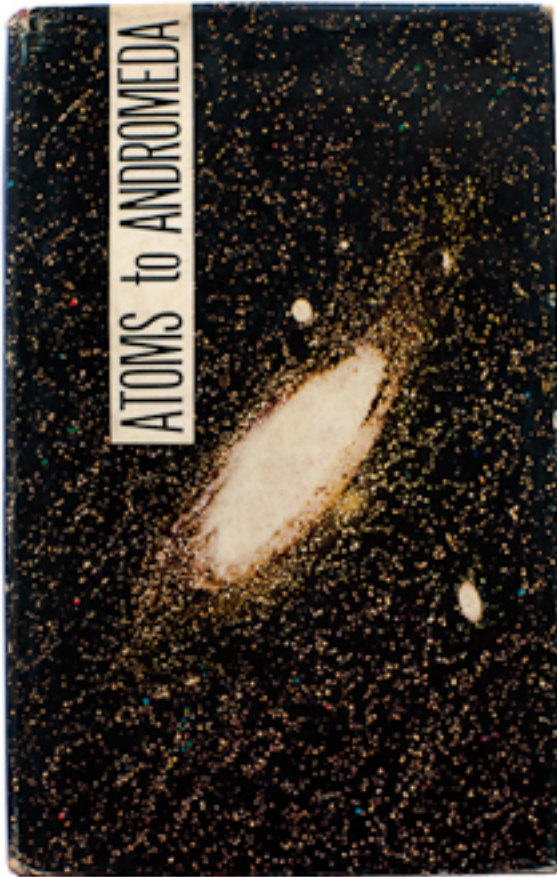
J Sumner Miller, Professor of Physics, El Camino College, University of California, USA

***Biographical Essays***



# ISS1966: Atoms to Andromeda

The International Science School Archives



## Participants

156 (104 boys; 52 girls)

## Convenors

ST Butler and H Messel

## Lecturers

ST Butler, Professor of Theoretical Physics, School of Physics, The University of Sydney

***Physics in the New Senior Science High School Course***

OA Guth, Executive Assistant, School of Physics, The University of Sydney  
***The University of Sydney School of Physics and its Nuclear Research Foundation***

R Hanbury Brown, Professor of Astronomy, School of Physics, The University of Sydney

***Light from the Stars***

MI Large, Senior Lecturer in Astrophysics, School of Physics, The University of Sydney

***Observing the Radio Waves***

RM May, Reader in Theoretical Physics, School of Physics, The University of Sydney

***Theoretical Physics***

DD Millar, Associate Professor of Plasma Physics, School of Physics, The University of Sydney

***Plasma Physics***

LS Peak, Lecturer in Nuclear Physics, School of Physics, The University of Sydney;  
MW Winn, Senior Lecturer in Nuclear Physics, School of Physics, The University of Sydney

***Cosmic Rays***

CS Wallace, Senior Lecturer in Electronic Computing, School of Physics, The University of Sydney

***Digital Computers***

[View full size](#)



# ISS1965: Time

The International Science School Archives



## Participants

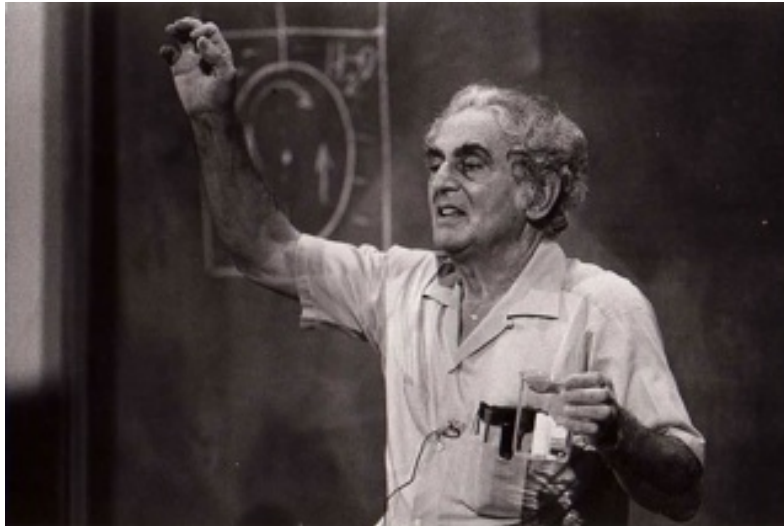
156 (114 boys; 42 girls)

## Convenors

ST Butler and H Messel

## Lecturers



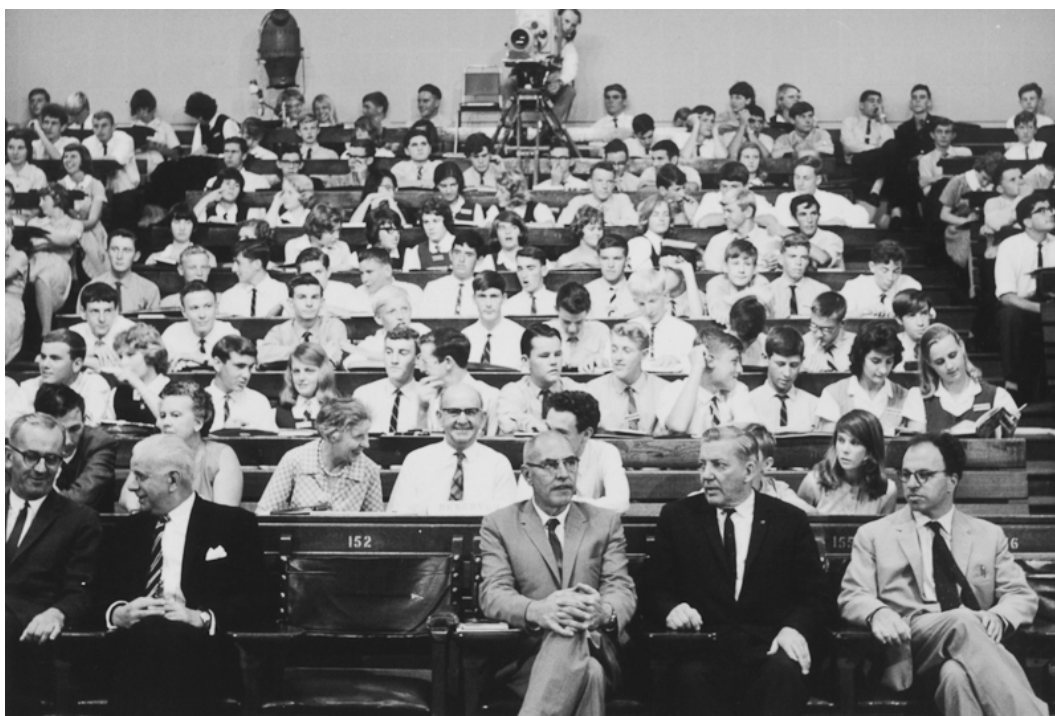


H Bondi, Professor of Applied Mathematics, Kings College, University of London, UK  
***Relativity and Time***

ST Butler, Professor of Physics (Theoretical), The University of Sydney, and H  
Messel, Professor of Physics, Head School of Physics, The University of Sydney  
***Time and the Universe***

T Gold, Professor of Astronomy, Cornell University New York; Director of the Cornell  
University Center for Radiophysics and Space Research, USA  
***The Arrow of Time***

J Sumner Miller, Professor of Physics, El Camino College, University of California,  
USA  
***Men of Science***

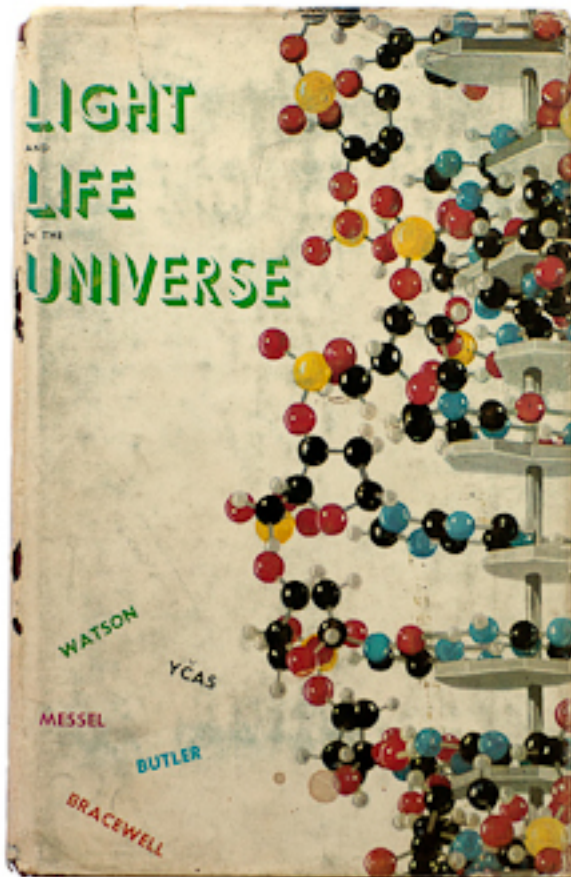






# ISS1964: Light and Life in the Universe

## The International Science School Archives



### Participants

159 (106 boys; 53 girls)

### Convenors

ST Butler and H Messel

### Lecturers

RN Bracewell, Professor of Electrical Engineering, Stanford University, California, USA

*Life in the Universe*

ST Butler, Professor of Physics (Theoretical), The University of Sydney, and H Messel, Professor of Physics, Head School of Physics, The University of Sydney  
*Atoms and the Universe – the Building Blocks and Environment for Life*

JD Watson, Professor of Biology, Harvard University, Massachusetts, USA  
***The Replication of Living Molecules***

M Ycas, Associate Professor of Microbiology, State University of New York, USA  
***Life and Its Origin***



# ISS1963: The Universe of Time and Space

The International Science School Archives



## Participants

155 (104 boys; 51 girls)

## Convenors

ST Butler and H Messel

## Lecturers

H Bondi, Professor of Applied Mathematics, Kings College, University of London, UK  
*The Structure of the Universe*

RN Bracewell, Professor of Electrical Engineering, Stanford University, California, USA

***Life in the Galaxy***

ST Butler, Professor of Physics (Theoretical), The University of Sydney, and H Messel, Professor of Physics, Head School of Physics, The University of Sydney  
***Atomic Physics and Applications of Atomic Energy***

W von Braun, Director, NASA, George C Marshall Space Flight Center, Huntsville, Alabama, USA  
***Space Rocketry***





# ISS1962: International Science School Archives

## A Journey Through Space And The Atom



### Participants

153 (108 boys; 45 girls)

Convenors  
ST Butler and H Messel

### Lecturers

H Bondi, Professor of Applied Mathematics, Kings College, University of London, UK  
***The Structure of the Universe***

RN Bracewell, Professor of Electrical Engineering, Stanford University, California, USA  
***Life in the Galaxy***

ST Butler, Professor of Physics (Theoretical), The University of Sydney, and H  
Messel, Professor of Physics, Head School of Physics, The University of Sydney  
***Atomic Physics and Applications of Atomic Energy***

W von Braun, Director, NASA, George C Marshall Space Flight Center, Huntsville,  
Alabama, USA  
***Space Rocketry***