

Malta Student Science Forum

1995-96

Topics Discussed

Science & Technology

The birth of the Universe

The elementary particles

Space Travel & extraterrestrial life

The DNA Molecule

New technological materials

The Frontiers of Medicine

Ethics

Is God necessary for Science?

Is their limit to man's knowledge?

Travel through time

Should we alter the human genetic code?

Who should control raw material prices?

Rights of the Aged vs Rights of the New Generation

1996-97

Topics Discussed

Scientific Issue

Biological time – The process of Ageing

Evidence for, and effects of pollutants in the Mediterranean

The technology used by the Egyptians to build the pyramids

The value of testing animals

The function of pesticides and fertilizers in Agriculture.

Moral Issue

Is it morally acceptable to spend vast amounts of resources to prolong?

Is pollution morally acceptable whilst it increases the cost factor of products essential for starving people?

Is the technology race, at the expense of other developments morally acceptable?

Modern drugs which have saved thousands of lives were developed on animals. Is this acceptable?

Is there a limit to their use?

1997-98

Topics Discussed

Can sunlight turn the wheels of industry and clean the world?

Sex, Drugs & Rock 'n Roll – The Biological Perspective

Are lotteries a taxation innumeracy? Can mathematical awareness help the average citizen become less gullible?

Agriculture without soil – Is slash and burn morally defensible?

Electronics and Artificial Intelligence – will computers ever decide for us?

Science and Technology in a societal context – Has the effect of Science and Technology on Society improved as a result of their recent advances?

1998-99

Topics Discussed

Is there a biological case for the legislation of any illicit drugs?

From Molecular Biology to Gene Therapy to ... Should the Scientific community be permitted to thread this road?

The World Wide Web – a beneficial addition to society?

Reflecting mirrors in space could mean the end of the day/night cycle as we know it today. Is such an option feasible?

Is there sufficient evidence for what has become known as “Global Warming”?

Big Bang Model of the Universe – old hat?

1999-00

Topics Discussed

Should mind altering drugs be freely available to the general public at large?

Why do things break?

In the coming months three innovative developments internet accessibility via TV, telephone and car, in the field of communications are set to become available. Will they result in a safer more productive environment?

Has the promise for artificial intelligence been fulfilled with the arrival of the new millennium?

Are genetically produced food stuffs here with us to stay?

2000-01

Topics Discussed

From a scientific perspective how would you manage the environment in Malta over the next century to prevent other disasters on the scale of Maghtab?

With the ongoing controversy of the use of Drugs in Sports –such as occurred in the recent Olympic Games held in Australia – Should we now consider lifting the ban on the use of drugs knowing full well the effects these substances can cause to the body?

Can you foresee the day or age in which computers will out perform our own brains/minds?

With the announcement this year by Prime Minister Blair and President Clinton of the sequence of the Human Genome, what do you think will be possible in the field of Genetics in the coming future?

In view of the current oil crises that has resulted in escalating prices for petrol at the pumps just to name one of the consequences of such, what proposals would you put forward for Malta in terms of energy efficiency and alternative energy to attain a sustainable energy scenario over the next century?

Science and Technology in a societal context- have our lives improved as a result of recent advances?

2001-02

Topics Discussed

From a scientific perspective how would you manage the environment in Malta over the next century to ensure a sustainable future for coming generations?

With the ongoing controversy of the use of Tobacco, Alcohol, Medicines and Illegal Drugs in society – Should we now consider lifting the ban on the use of drugs knowing full well the effects these substances can cause to the body?

With the announcement this year by an American Biotechnology Company, on their ability to clone human cells what do you think will be possible in the field of Genetics in the coming future?

What proposals would you put forward for Malta in the field of alternative sustainable energy resources to cover our energy needs over the next century?

Can you foresee the day or age in which Artificial Intelligence will out perform our own brains/minds?

2002-03

Topics Discussed

Medicines, plastics, detergents, cosmetics the list seems endless but many of life's comforts would be impossible without the Chemical Industry. However, these benefits are associated with other fields while chemistry in the public's mind is associated with pollution to accidents in chemical factories. Describe the chemical processes involved in the production of your favourite comfort and those in particular that have adopted "Green Chemistry" processes.

Explain the Science involved with human reproductive cloning and why such a procedure may undermine our sense of self or identity.

With the ongoing controversy on the free use of cannabis in society that has occurred in the United Kingdom recently – Should we now consider lifting the ban on the use of cannabis in Malta knowing full well the effects this substance has on the body.

In view of the current Middle East and Iraqi crises that has resulted in escalating prices for petrol at the pumps, just to name one of the consequences of such, would the use of the electric car in Malta provide an efficient means of transport as well as reduce sufficiently our dependence on such a traditional energy resources?

Describe the scientific procedures and social responsibilities related to the management of our environment and how these may be implemented in Malta over the next decade to prevent other disasters on the scale of Maghtab.

2003-04

Topics Discussed

Describe the scientific procedures and social responsibilities related to the management of our environment and how these may be implemented in Malta over the next decade.

Give a brief overview of the mathematical principles involved in Game Theory and how it may be applied to Maltese Society (Economic activity, Politics, Village band clubs/feasts...).

Can you foresee the day or age in which computers will outperform our own brains/minds?

Explain the biological mechanisms involved with the perception of sound and the novel use of man made devices in society.

Water, water everywhere and not a drop to drink! Outline the science of water conservation and production in relation to the situation in Malta paying particular attention to the need of a viable strategy for the delivery of quality water.

2004-05

Topics Discussed

Personalised medicine will now become the way forward - that is therapies developed to target a number of diseases such as cancer based on the genetic make-up of the individual - what are the ethical implications in the road to discovery as well as the social domain? With the ongoing controversy of the use of Tobacco, Alcohol, Medicines and Illegal Drugs in Society, should we consider lifting the ban on the use of drugs, knowing full well the effects these substances can cause to the body?

Can the use of Chaos theory help us to understand the origin and maintenance of life here on earth?

With the ongoing controversy of the use of Tobacco, Alcohol, Medicines and Illegal Drugs in Society, should we consider lifting the ban on the use of drugs, knowing full well the effects these substances can cause to the body?

What should a Science Policy for Malta be based on in the wake of Malta's entry to the EU?

Oil prices have risen to \$50 a barrel. Is it now the right time to move to nuclear fuels in the wake of 9/11?

2005-06

Topics Discussed

The Pharmaceutical industry – Life saving research or profits at the expense of patients?

How would you plan a protection from emerging infections and bioterrorism?

How would you determine the best alternative energy source for Malta?

The scope of Tissue Engineering for the future

RNA interference... Panacea or Another Threat?

2006-07

Topics Discussed

What could be the benefits of climate change for life in the future? What action should be taken to ensure the best possible future?

From what we observe in nature, would human cloning provide “preferred” genotypes to the human gene pool and prevent deleterious genes from spreading or would it place the survival of the human species at risk? What are the implications of artificial selection and the evolution of “Man-king”?

What will be the implications of this virtual reality technology in our everyday lives in the near future? How is this technology perceived and/or misunderstood?

What should be the rural and agricultural development strategy in the Mediterranean region (with particular focus on the Maltese Islands) for the near future? What could be effect of GMOs and new technological advances on such a strategy? What will be their effect on our lives and well-being?

With all the advances in exploratory and travel technology, where will humans be in a few years time? How might we get there? Will we travel only through space or will we breach the boundaries of time?

2007-08

Topics Discussed

Since its invention in 1985 DNA profiling has revolutionised different aspects of science in many ways. It has found an application in forensic science, identification of humans, animals and plant life as well as facilitating the study of migration patterns of ancient human populations.

A) The DNA profiling technology has improved dramatically over the past decade. Describe the developments of DNA profiling technology, referring briefly to how these advancements have made possible its application in a number of scientific fields.

B) Using appropriate examples describe the applications of DNA profiling in modern day science and discuss the associated ethical and practical implications of this technology.

Sea level rise is a direct effect of global warming. With the Maltese Islands being the size they are and having a significant percentage of the coast inhabited or in use, the rise in sea level will have serious repercussions on Maltese life.

A) Discuss the consequences bound to happen in this situation.

B) What infrastructural solutions, other than building up instead of out, might be available to alleviate this problem?

CERN: The Large Hadron Collider

A) The CERN Accelerator Infrastructure

a) The Accelerator Chain (Linac, Proton Synchrotron Booster, the Proton Synchrotron, the Super Proton Synchrotron, the Large Hadron Collider)

b) General Accelerator Principle (particle injection, particle acceleration, particle collision, beam dump, principle of the synchrotron)

c) The different constituents of the LHC (Superconducting Magnets, RF cavities, beam dump, collimators)

d) The principle of particle detectors

e) Description of the Compact Muon Solenoid detector.