EUROPEAN COMMISSION

Community Research

LIST OF THE PARTICIPATING PROJECTS

16th European Young Scientists Contest, Dublin, 25-29 September 2004

1. **AUSTRIA**: *Engineering*
   A break-through in the manufacturing of condenser microphones
   They developed and manufactured the first automated self-tuning device for condenser microphone-membranes. Normally microphone diaphragms are adjusted by hand leading to a wide scatter of vibrations (the eigen frequency). The newly developed device is able to adjust diaphragms automatically and very accurately, avoiding such vibrations and this in turn reduces production time and lowers production costs.
   Participants: M*artin Knöbel, Gerhard Schöny and Florian Grössbacher*

2. **AUSTRIA***: Engineering*
   An alternative method for keeping swimming pool water clear
   The conventional treatment of swimming pool water still involves using chemicals which can be harmful. The handling and storage can also be hazardous. This team has developed a new electrolysis method for swimming-pool care which uses sodium sulphate (Glauber's salt) and sodium chloride (common salt) as base materials which are both considerably less harmful and easier to manage.
   Participants: *Lukas Brenner and Christoph Ritzberger*

3. **AUSTRIA**: *Biology*
   The brain and music
   A study was conducted on the positive effects of music on spatial-temporal reasoning. The experiment involved three groups, one listening to nothing, one listening to pop music and one listening to Mozart. Subsequent tests found that the spatial-temporal reasoning of those listening to the classical music improved because listening to Mozart on a 30-second loud-silent-cycle for 10 minutes mimics our basic brain-wave patterns.
   Participants*: Paul Schinninger*

4. **BELARUS** *Computer*
   The physics of handwriting
   In this project the process of handwriting itself is analyzed using a physical approach. The analysis of the written word is commonplace but the analysis of the kinematic properties of handwriting – which constitutes the main part of this research – is not. They look at the speed, direction and any changes in velocity of the handwriting and also monitor the pen movements.
   Participants: *Dzmitry Makatun, Volha Dzmitruk*

5. **BELGIUM** *Physics*
   From calculus to torsion.
   He developed a novel technique for measuring the drag coefficient (Cx) for objects moving at extremely low velocities (a few millimetres per second) through still air. Normally the drag coefficient is measured using air passing at high velocities over stationary objects. The new method offers many opportunities to design accurate meters in the field of fluid mechanics.
   Participants: *Frédéric Collonval*

6. **BULGARIA:** *Biology*
   DNA: Study on MIC A and MIC B gene polymorphism
   The aim of the project is to investigate for the first time two new non-classical HLA polymorphic genes, namely MIC A and MIC B, in the healthy Bulgarian population. The results will contribute to further characterization of these new genetic markers and could be applied to anthropological and epidemiological studies.
   Participants: *Tsvetelin Lukanov*

7. **BULGARIA:** *Mathematics*
   Rijindael (AES) analysis.
   In this project the contestant describes and analyses a modern block cipher – the Rijndael cipher. It is expected that this cipher will have wide uses and a profound impact on modern communications. The project describes Rijndael's encryption and decryption algorithms as well as its key generation algorithm.
   Participants: *NIKOLAY LANDJEV*

8. **BULGARIA:** *Physics*
   Calculating the equilibrium configurations of particles restricted on a spherical surface
   This work is devoted to studying the equilibrium configurations of particles placed on a spherical surface, which interact with each other by means of Coulomb forces. The contestant explored this situation for different numbers of particles, ranging from a few to over 500.
   Participants: *Nikolay Hadzhiev*

9. **CHINA:** *Biology*
   An elementary study of the evolution of arthropod walking mannerisms
   The key to this project is to find the evolutionary trend of arthropods by comparing the structures, moving features and mannerisms of a sample of arthropod legs. The walking mannerisms are recorded by video camera and the study is carried out with the help of a computer-generated freeze frame, replay and data-analysis.
   Participants: *Zang Pengyuan*

10. **CZECH REPUBLIC** *Chemistry*
    A new system for cation detection
    The construction of highly selective electro-chemical sensors is one of the leading themes in supra-molecular chemistry. This project devises a new system using classic cation receptors and a highly lipophilic cobalticarboranes anionic species for cation detection. The data shows that this approach is more efficient

and makes it ideal for cation detection and opens a new way for the construction of ion-selective electrodes.
Participants: *Jiří Tutsch*

11. **CZECH REPUBLIC** *Environment*
A new way of counting the number of wood ants in an anthill
This contestant realised that there was no suitable method to calculate the volume of an anthill and has suggested a new model to establish this. The new model measures the height and diameter of the anthill using digital photography. He also devised an interactive guide to identify wood ants with the use of computer technology.
Participants: *Jan Nešpor*

12. **CZECH REPUBLIC** *Engineering*
Control systems of the biomass combusting process.
This project designs and constructs a control unit for a just-in-time boiler to burn wood waste. The boiler is designed as an automatic unit to burn wood waste such as sawdust, wood shavings and other bits of wood. The control unit has practical uses such as controlling various house heating systems.
Participants: *Martin Řezáč*

13. **DENMARK** *Chemistry*
Improving the method for synthesizing N-methyl fluoxetine in the laboratory.
This project combines theoretical observations with experimental work to improve an original method of synthesizing an antidepressant drug. The project hopes to help students realise that the work in the laboratory has a very real effect on people's lives outside the laboratory.
Participants: *Charlotte Strandkvist*

14. **ESTONIA** *Engineering*
Comparing copper and aluminium in actual radio technical environment.
Large communications antennae take radio waves out of the air. The better the antenna the better the reception but they are also the most exposed to the elements. The aim of this study this is to compare different well-known available materials which are used in radio technical systems – aluminium and copper – to find out how the characteristics of copper and aluminium change if they oxidize and get dirty.
Participants: *Tanel Ainla*

15. **ESTONIA** *Earth Sciences*
Reasons for changes in soil water content
This work investigated the relationship between soil moisture, atmospheric characteristics and vegetation. The main purpose of this research was to study the soil properties, and links between the changes in soil moisture, air temperatures and rain amounts, in order to examine availability of water for plants in varying atmospheric conditions.
Participants: *Sten-Erik Enno, Kaupo Mändla*

16. **EUROPEAN SCHOOL** *Environment*
    Investigating the removal of heavy metals from processed bottom ash.
    In Holland household and industrial waste are incinerated to provide electricity. During this process various materials are removed leaving bottom ash – about 25% by mass of the original waste. This ash contains metals such as copper, cadmium and mercury making it an environmental problem. Initial experiments were performed to find the best approach to removing these metals.
    Participants: *Richard Broadbent*

17. **FINLAND** *Biology*
    Species composition of butterflies in a tropical rainforest.
    In order to study the effects of the destruction of the rainforest on butterfly communities, a field study was carried out in which two collections were obtained: one from inside the rainforest, and one from a cleared area. The idea was to collect the samples in a random way so the collections would represent the butterfly communities of the two habitats. The two collections were classified and listed so that their compositions could be compared.
    Participants: *Tom Ehrström*

18. **FRANCE** *Physics*
    Chronicles of a death foretold
    This study looks into why and how soap films vanish. In this project, the contestant studied many properties of soap. She studied surface tension, vibration modes, resonance, and Karman vortices. A special emphasis was placed on the study of the draining and thinning mechanisms of soap films.
    Participants: *Emmanuelle Médrinal*

19. **FRANCE** *Physics*
    Development of an atomic force microscope
    The group decided to make their own atomic force microscope on the basis of existing models but increasing the number of possible applications. The second goal was not to exceed a budget of 300 euros while maintaining the atomic resolution**.**
    Participants: *Nicolas Porcher, Guillaume Romeu and François Tissot*

20. **FRANCE** *Biology*
    Aerobic sport to music: more performance – less backbone problems
    The contestant developed sport exercises to prevent postural deformities by strengthening the backbone's muscular system. The special exercises are individually adaptable, either as gymnastic games or they can be applied using sports equipment. The contestant also found that these exercises improved concentration, creativity and long-term memory.
    Participants: *Cléo Bertelsmeier*

21. **GEORGIA** *Mathematics*
    The amazing properties of the isosceles triangle
    The properties of an isosceles triangle are such that two line segments are equal. These line segments are formed by connecting the bases of medians, heights and bisectors. This project asks the question if the inverse of this theorem is correct: when the line segments in any triangle are equal does this make it an isosceles triangle.
    Participants: *Konstantin Karosanidze*

22. **GEORGIA** *Cytology*
    3D vision of cancer cell nucleolus: a new approach to measuring the sensitivity of ribosomal genes to anti-cancer drugs
    The control of cancer formations is a major problem of modern medicine. One of the most effective ways of reducing this growth is chemotherapy. This project develops a new approach to evaluate the effects of conventional anti-cancer drugs in cancer treatment on the Ribosomal genes.
    Participants: *Abzhandadze Eka*

23. **GEORGIA** *Biology*
    Two-faced Janus: an experimental-behavioural approach.
    The goal of this project was to create a scientific basis for the experimental separation of two fundamental phases in the memory process: the encoding phase and the retrieval one. This was done by conducting a behavioural study of memory in cats through various trials and tasks.
    Participants: *Nino Zavrashvili*

24. **GERMANY** *Computer*
    Internet access for guests
    The project developed a device which is attached simply between a laptop and a host network to allow the 'guest user' access to the Internet, while at the same time protecting the host's network from undesired access. That makes the situation comfortable for both host and guest. It is designed for people travelling on business with their laptops who want to connect to a different company networks.
    Participants: *Roland Bauerschmidt*

25. **GERMANY** *Physics*
    An ultrasonic detector for gas chromatography
    A traditional gas chromatograph analyses gas mixtures and their components. These are expensive so this contestant developed a cheap but very sensitive ultrasonic detector based on the relationship between sound velocity and the molecular mass of a gas. The analyses can be done using a PC software package.
    Participants: *Mario Chemnitz*

26. **GERMANY** *Engineering*
    Miniaturized turbo jet engine
    This young scientist constructed a working miniature turbo jet engine. Instead of buying an engine for his model aircraft he built one that is lightweight and starts by itself. It has its own power unit and is encased in a coffee can.
    Participants: *Michael Achtelik*

27. **HUNGARY** *Medicine*
Specific inhibition of the sodium-calcium exchange system in heart muscle cells
Nowadays one of the most frequent causes of death is sudden cardiac seizure, associated with cardiac diseases, which may emerge because of various cardiac rhythm disturbances. This project looked at the role of sodium-calcium in the heart and examined a specific inhibitor of the sodium-calcium exchanger.
Participants: *Krisztina Berek*

28. **HUNGARY** *Medicine*
Cost-effective manufacturing of prostheses via rapid prototyping using 3D computer models reconstructed from 2D medical images
The project combines modern technology and traditional equipment to give medical institutions a vital tool to offer cost-effective solutions for prostheses.
Participants: *Zsolt Erő and Bálint Bártfai*

29. **HUNGARY** *Engineering*
An electric shopping cart and scooter trailer
The project produced an environmentally sound, energy efficient, vehicle. Due to its high electrical efficiency (it recharges the batteries while braking on a slope) and its low energy consumption (120-150 W, max. 280 W) the batteries of the *eSCART* can be recharged even with solar photovoltaic elements or fossil energy (4 cents/30 km daily)
Participants: *Zsófia Dőry*

30. **ICELAND** *Computer*
Exploring the relationship between creativity and the environment using simulated beings
This study presents a new approach for studying the connection between creativity and the environment. It explores the hypothesis that creative behaviours will emerge as environmental complexities increase.
Participants: *Hrafn Thorri Thórisson*

31. **ICELAND** *Psychology*
The Hashcat experiment
This research was to find out if it was possible to train cats to search for drugs. The team tried to teach two cats to search for tea, which is made from a plant, like hash. The project is based on both psychological and biological principles.
Participants: *Elísa Guðrún Brynjólfsdóttir, Eva María Thrastardóttir, Stefán Þór Eysteinsson*

32. **IRELAND** *Mathematics*
Generalised Continued Fractions (GCF)
This project uses spreadsheets to generate, evaluate and display Generalised Continued Fractions. The generation, evaluation and display of Generalised Continued Fractions using spreadsheets are entirely new. He reports the discovery of GCF's for transcendental number in which there is a predictable pattern.
Participants: *Ronan Larkin*

33. **IRELAND** *Physics*

Self-organised criticality in the dynamics of granular systems

This project examined the physics of sand piles as the stereotypical example of systems which produce structure from disorder without tuning. They showed that while ideal computer sand-pile models give rise to ideal critical-point behaviour, more realistic models exhibit enhanced numbers of large events due to the effects of finite system size.

Participants: *Roisin McCloskey and Breandan MacChnioc*

34. **ISRAEL** *Medicine*

Issues in ovarian freezing for fertility preservation

The aims of the study were to measure the quantity and quality of immature eggs in the ovaries of patients before and after anti-cancer treatment in order to evaluate when it might be worthwhile to freeze ovarian tissue after anti-cancer treatment and to investigate if supplementation of growth factors can promote the development of these immature eggs.

Participants: *Tehila Lavi, Reut Cohen, Reut Suliman*

35. **ISRAEL** *Biology*

Tumour angiogenesis research as a part of anti-cancer therapy development

This project investigates a new treatment method that takes into account not only the effect on cancer cells, but on the blood vessels generated (via angiogenesis) adjacent to the tumour. This work is based on mathematical analysis of results obtained from experiments performed by MRI in the Weizmann Institute.

Participants: *Valentina Arakelyan*

36. **ISRAEL** *Environment*

The application of entomopathogenic nematodes against phorides flies

In this project, the participants examined the efficacy of 11 strains of insect-killing nematodes from two families to control phorids and also studied their ability to remain in the compost (the mushroom cultivation platform).

Participants: *Reem Taha*

37. **ITALY** *Engineering*

Image printer motion display

Motion Display is a machine that the contestant built entirely using salvaged materials, which displays low-resolution pictures of 96 pixels using only eight sources of light. The display consists in a column of eight LEDs which is moved quickly back and forth along a rail by a connecting rod pivoted on a spinning wheel powered by an electric engine.

Participants: *Carlo Terruzzi*

38. **ITALY** *Mathematics*

The shortest path problem

Minimizing a network's length is one of the oldest optimization problems in mathematics. The Steiner problem was to find the point *P* that minimizes the sum of the distances from *P* to each of three given points in the plane. The team analysed several applications of the Steiner problem tree connected to ordinary life. In fact this problem can be useful for the construction of railways, motorways, piping systems, and integrated circuits.

Participants: *Martina Basini – Giulia Bianchi*

39. **ITALY** *Biology*

Study on quality and conservation of kiwi fruit

The project involved a series of experiments with the aim of improving the quality and longevity of the kiwi fruit. They looked at the function of enzymes during the maturation of the kiwi fruit and then attempted to improve the quality and preservation of the kiwi fruit without acting on a genetic level.

Participants: *Giulia Lena, Damiana Montanino and Linda Raggi*

40. **LATVIA** *Physics*

Thin films of nickel phthalocyanine as ozone sensors

This participant investigated ways of designing new ozone sensors by using thin films of nickel phthalocyanine on gold. He measured their surface potential in the presence of ozone. Results showed that surface potential change of organic films in different gases can be used to detect concentrations of different gases and thin films of nickel phthalocyanine can be used to detect concentrations of ozone in a certain environment.

Participants: *Martins Brics*

41. **LATVIA** *Biology*

Research and protection of owls in the surroundings of Plavinas

The research was aimed at establishing the number of owls and their distribution in the surroundings of Pļaviņas and to attract owls using nest-boxes. It is hoped that this research will stimulate society's interest in the owl and that as many people as possible get involved in the conservation activities.

Participants: *Gaidis Grandāns*

42. **LATVIA** *Physics*

Scientific breakthrough will save the world

The project announces a breakthrough for people with heart problems – photoplethysmography. PPG opens new ways of diagnosing cardiovascular diseases and of controlling a person's health. No longer will there be a need for large devices to control or diagnose cardiovascular disease because this project suggests using a small 'box' which will be able to measure our health anywhere and at any time.

Participants: *Vitālijs Jasčišens*

43. **LITHUANIA** *Environment*

An analysis of the water in the lakes of Trakai and a new biosensor for the determination of heavy metals.

The main purpose was to carry out the water quality analysis of the lakes surrounding the city of Trakai, which are being intensively used by the local inhabitants and holidaymakers. The contestant wanted to estimate the eutrophication, self-cleaning and other processes, and to look for new methods to determine the amount of heavy metals.

Participants: *Laurynas Pliuškys*

44. **LITHUANIA** *Biology*
An investigation into the population and ecology of sea-holly (eryngium maritimum l.) in the Curonian Spit National Park
She investigated the spread and the vitality of sea-holly. Sea-holly grows in an Unesco global heritage site in Lithuania. It was widespread but now is disappearing and this research investigates the viability of the sea-holly.
Participants: *Kristina Suriakaitė*

45. **LITHUANIA** *Medicine*
Viscotoxins isolation and cytotoxity.
A study in the use of mistletoe extract as an alternative medicine for the treatment of epilepsy. Medicines from mistletoe have widely been used in the treatment of some cancers but this study explores the antiepileptic effects of mistletoe which could be used in the treatment of epilepsy.
Participants: *Julius Bogomolovas*

46. **MALTA** *Engineering*
The construction of a motorized chair for disabled people.
This contestant constructed an electrically powered motorised chair. It works on caterpillar tracks and includes a gradient stabilizer allowing the user to ascend stairs, go up and down pavements, and travel comfortably over rough surfaces. The user is therefore not limited to go only to places where there are ramps and becomes more independent as a result.
Participants: *Luke Mercieca, Clayton D'amato*

47. **NETHERLANDS** *Biology*
Tears research
These contestants conducted research into tears and looked at how the eye works when it cries. They examined, in particular, the different chemical compositions of tears when they were evoked by an emotional stimulus such as heartache, a sad film and a chemical or irritating stimulus like an onion.
Participants: *Janneke Verheijen, Mechteld van den Bosch*

48. **NORWAY** *Engineering*
A tilting car
The aim of this project was to develop a car that tilts inwards when driving around bends and corners so that the resultant of the centrifugal force and the force of gravity always work perpendicular to the seats of the car. The result is a more comfortable drive as the driver and passengers will no longer be pulled outwards when the car is turning.
Participants: *Andreas Bakke*

49. **NORWAY** *Engineering*
The Anitra computer
A computer is a machine that, given enough time and memory, can perform any rigidly defined computational operation. A minimalist computer is a computer that satisfies this requirement with only a minimum level of architectural complexity. Hypothetical minimalist computers have long been an interesting study in computer science but there are few actual hardware examples - this project designs and constructs such a computer.
Participants: *Eirik Bakke*

50. **POLAND** *Engineering*
Astronomical observation. Stargate I - an automated astronomical observation robot
The participants designed and built and inexpensive robot that can automatically perform astronomical observations. It consists of a mechanical device with a mounted camera, a PC computer and an electronic module. The mechanism is inclined and tracks the stars by turning on an axle. They hoped that the device would be able to discover new variable stars and thus improve our knowledge of the universe.
Participants: *Marek Cieslar, Jacek Czyzewski, Jakub Pietrzak*

51. **POLAND** *Mathematics*
A counterfeit coin
The counterfeit coin problem is a classic puzzle. It refers to the following basic situation: There are twelve coins that are identical in size, shape, colour, smell, and general appearance. One coin, however, is counterfeit, having a slightly different weight than the other eleven coins. The aim is to identify the counterfeit coin using a two-pan balance deploying the smallest possible number of weighings.
Participants: *Marcel Kolodziejczyk*

52. **POLAND** *Biology*
Ants learning process.
This project studies how ants find their way in complicated mazes. It is assumed that they learn their way so to test this he built a wooden labyrinth and designed six experiments. He observed how the ant workers of two species, the red wood and the Amazon ants, behaved and placed a bait at the exit – with interesting findings.
Participants: ***Artur Lewandowski***

53. **PORTUGAL** *Engineering*
A spider robot
The spider robot is a hexapod robot (with six legs) which moves by means of two servo-motors. It also has a grip to manipulate objects and a video camera with a wireless transmission system, containing an audio and video transmitter installed on top of the robot. It is remotely controlled by a radio-controller and its operator doesn't need to have a direct visual contact with the equipment, unlike the robots used for bomb-dismantlement. The robot can be commanded from up to fifty metres and get enough power from two 6V batteries to run for several hours.
Participants: *Carlos Arsénio*

54. **PORTUGAL** *Physics*
Computer-generated holograms
Holograms are 3D images obtained by diffraction resulting in an interference pattern created by two laser beams. The aim of this project is to develop a computer program that simulates the interference pattern from digital images and then prints the result to produce a "computational hologram". He developed holography software – a Digital Hologram Processor – and conducted several experiments to optimise the results obtained.
Participants: *Ângelo Arrifano*

55. **PORTUGAL** *Physics*
Projectiles: from Earth to Space
In this project, a complete study of projectiles was made, not only in a lab (where precise data was gathered, using the necessary devices), but also in a gym (where data from basketball throws was gathered). On calculating the data one could not only observe the similarities between practical and theoretical results, but also create computer models and animations which will provide great tools for the future research in this area.
Participants: *David Sobral*

56. **RUSSIA** *Mathematics*
The expansion of algebraic structures: a comparative analysis and computer realisation
This project presents a new type of analysis based on graphical representation. It has many advantages over other methods, because it simplifies the analysis and also the analytic models of the graphical representation can be useful for computer analysis.
Participants: *Alexander SIRITSA*

57. **RUSSIA** *Engineering*
A direct current induction electric engine
This work develops a new design of a direct current inductive electrical engine that does not include a collector. The engine generates its energy to move the rotor from the secondary winding of the rotating transformer on the same axis as the rotor itself.
Participants: *Dmitriy STANOVYKH*

58. **RUSSIA** *Environment*
A set of installations to purify water for daily use
Water is necessary for life but we are struggling to meet the daily demands of clean and fresh water worldwide. The goal of this research was to develop a set of installations which could solve the problem of water pollution. These systems can be used for sewage purification, disinfection of swimming pools and purification of drinking water.
Participants: *Sergey ORLOV, Ekaterina KULIKOVA*

59. **SLOVAKIA** *Engineering*
DODO in a nutshell
The main aim of this project was to test a board made of crushed nutshells and to identify the possibilities of mass production of this nutshell board in Slovakia. It was established that nutshell had a similar composition to wood. It was found that the board made from nutshells was durable and water resistant. The research also showed that there are enough nutshells in Slovakia to produce 4000 cubic metres of board.
Participants: *Ján Demko and Marek Šuľa*

60. **SLOVAKIA** *Physics*
Mach's principle – varying speed of light theory as a new cosmological model.
This project uses the Mach principle to create a new cosmological model. The project investigates varying the speed of light based on the Mach principle and to

examine the idea that local laws are influenced by the global structure of the universe through some fundamental constant.
Participants: *Martin Krššák*

61. **SLOVAKIA** *Engineering*
A new technical application of Coanda effect on the no-ending wing of model X-600
This participant designed a light airplane with small dimensions that would take off or land vertically using the theories of Professor Coanda. This type of invention would be useful for the future needs of the transportation industry in the 21st Century might do away with the need for long runways.
Participants: *Štefan Tkáč*

62. **SLOVENIA** *Engineering*
An investigation into the old Krakovo suburb in the centre of Ljubljana
Krakovo is one of the oldest suburbs but has been neglected despite its location close to historical centre of Ljubljana. However, this area might be one of the oldest medieval suburbs still remaining with its original layout. Little is known about this part of the city, its origins nor architectural concept as very little written material exists. This project hopes to address this.
Participants: *Vesna Lenart and Urska Dolinsek*

63. **SLOVENIA** *Mathematics*
The visualisation of Complex Functions
The aim of this research was to consider methods of visualisation of functions with complex variables. Two different methods were considered, a traditional one using the transformation of the complex plane and one new method was devised using a four-dimensional graph. The question of whether or not these two methods are connected in any way was also addressed.
Participants: *Sebastjan Meznaric*

64. **SPAIN** *Biology*
A genetic journey: analyzing the Aromuns population in the Balkans using ALU insertions, PCR and electrophoresis
This project investigates the origin of a previously unstudied population in the Balkans (the Aromuns) using ALU polymorphisms and their relationship with other neighbouring populations in the Balkans. Four Aromun samples (two from Macedonia, one from Albania and one from Romania) and five neighbour populations (Macedonians, Albanians, Romanians, Greeks and Turks) were analysed by means of genetic distances, principal components and analyses of the molecular variance.
Participants: *Arnau Busquets García*

65. **SPAIN** *Biology*
Influential factors in the development of moulds and yeasts on homemade marmalades
Fungal growth is the most common and dangerous factor in homemade marmalade degradation. Natural methods like sucrose adding, special bottling or temperature control could prevent mould and yeast growth if combined adequately. In this project 270 samples of homemade plum, banana and peach marmalade were exposed to every different combination of these factors and observed over 60 days.

Participants: *Beatriz Cano Martínez*

66. **SWEDEN** *Biology*
Yellow-legged gulls in the Secovlje Saltpans, Slovenia
This project developed new methods for observing the post-breeding behaviour of the yellow legged gull. The gulls cause problems on the Saltpans by polluting the salt and disturbing other breeding birds so the project also looked into potential solutions to these problems and suggested further studies and measures that might be undertaken.
Participants: *Linus Blomqvist*

67. **SWITZERLAND** *Physics*
Observations of the comet 153P/Ikeya-Zhang
The task of this work was to observe the comet Ikeya-Zhang over a long period in order to document its activity and to search structures in the coma to obtain information about active regions on the cometary nucleus and its rotation movement.
Participants: *Barbara Burtscher*

68. **SWITZERLAND** *Engineering*
An alternative rocket propulsion
The idea is to construct an optimised alternative rocket propulsion system using common household articles, such as vinegar and baking powder. These were chosen because of their well known chemical reaction and also because they are safe and cheap. The aim of the project was to produce a working rocket based on this reaction to send a rocket body up from a launching pad while also keeping safety in mind.
Participants: *Lena Gyssler, Andreas Moor, Stefan Schumann*

69. **TURKEY** *Computer*
N-gram based language classification
In this project an automatic language identification algorithm has been developed, programmed and extensively tested on European languages. Such algorithms help to identify the language in which a given brief sample text is created, and they find applications in various applications such as web searches, e-mail routing, and man-machine interfaces for the blind.
Participants: *Ocan Sankur*

70. **TURKEY** *Physics*
Construction of a seismograph
The aim of this project was to develop a new kind of seismograph for taking measurements of seismic waves. The seismograph consists of a pendulum with a characteristic frequency which is brought into forced oscillation by a seismic wave. Measurements are taken, registered on computer and a program interprets them.
Participants: *Mehmet Halit Calayir, Mehmet Cakan*

71. **UKRAINE** *Biology*
A study of the extinct and rare endemic plant species of the Granite-Steppe South Bug region
The object of the study was to examine seven rare and endemic plant species from a canyon in the Granite Steppe Bug region in the Ukraine which are

threatened with extinction on a global scale and to devise ways of preserving them.
Participants: *Katerina Novosad*

72. **UNITED KINGDOM** *Biology*
Use of parasites as bio-indicators of seawater quality
This team analysed seawater quality to establish what effect heavy-metal pollution was having on aquatic communities. They did this by using the cercariae of the marine trematode and measuring the horizontal swimming rate and longevity of the parasite.
Participants: *Dearblha Mc Kenna, Maureen O'Sullivan and Brenda Kearney*

73. **USA**: *Engineering*
Increased channel capacity in fibre optics through the transmission of multiplexed orbital angular momentum states
This project sets to increase channel capacity in fibre optics by an enormous factor using an innovative system. Present high-density systems are encountering “cross talk” and will soon be unable to increase the number of channels and this increased channel capacity in fibre optics will mean that more information can be transmitted, and more information means faster internet and potentially more efficient processors.
Participants: *Christopher Verlinden and Philip Munoz*