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News alert

Scientific excellence through European collaboration: € 1 million EU Descartes Prize rewards two projects in the field of medicine and astrophysics

The EU Descartes Prize was awarded today to two research projects in the fields of medicine and astrophysics. One project greatly advanced our understanding of Multiple Sclerosis and is offering leads for new drugs. The other project has discovered the origins of Gamma Ray Bursts and is providing insights into star and planet formation. The €1 million prize rewards outstanding scientific research through transnational collaboration.

The two prize-winners were selected from a short-list of ten collaborative projects from a wide range of fields of scientific research. Total entries this year reached 108 - double that of last year. The winners were selected by the Descartes Grand Jury, presided by Yves Michot, former President of Aerospatiale Matra, and including eminent figures from academia and the private and public sectors. The jury once again had the difficult task of selecting "the best of the best".

“The high standard of submissions clearly demonstrates both the excellence of European science today and the value of European collaboration in the scientific field,” said European Research Commissioner Philippe Busquin. “I welcome the growing interest in the Descartes Prize, which stresses the importance of transnational co-operation in creating a truly European Research Area (ERA). One of the most important features of the ERA is the greater impact that researchers can make when they work together beyond national borders. Sharing resources and joining forces is key in achieving excellence at EU and international level. This will in turn improve EU’s competitiveness and quality of life."

Tackling MS – a disease affecting at least 350.000 people in Europe

An award of €500,000 went to a project, which has carried out groundbreaking work on Multiple Sclerosis (MS), the chronic inflammatory degenerative disease of the nervous system. The project, led by Professor Lars Fugger of Aarhus University Hospital, Copenhagen (Denmark), in co-operation with other research teams from Denmark, Sweden, the UK and the USA, has significantly advanced our understanding of the immunological basis of the disease, providing an important platform for the development of new drugs. Through their experiments, the team successfully defined the principal players in the autoimmune attack and explained how the virus starts a disease.

Explaining our origins with the aid of satellite BeppoSAX

An equal award of €500,000 was presented to a project investigating the point of origin of Gamma Ray Bursts (GRBs). Led by Dr. Edward Van den Heuvel of the University of Amsterdam, in collaboration with research teams from the Netherlands, Italy, Denmark, Spain, UK and Germany, this project has made significant progress in advancing our understanding of these giant stellar explosions. This will help astronomers in tracing the history of star formations in the universe. Thanks to the Italian/Dutch satellite BeppoSAX and

its unique multi-faceted capabilities, the team of European scientists solved what has been one of the greatest mysteries of astrophysics for 30 years: the places of origin of GRBs. Finally, the astrophysics project provides, for the first time, confirmation that gamma-ray bursts (GRBs) are the most powerful explosions in the universe, second only to the Big Bang.

Prizes presented at the European Patent Office, Munich

The ceremony was held in the presence of Mr. Rainer Gerold, Director of the Science and Society Directorate of the European Commission on behalf of Commissioner Philippe Busquin, Mr. Otto Wiesheu, Bavarian Minister for Economy, Transport and Technology, Mr. Pantelis Kyriakides, Vice-President of EPO and Mr. Yves Michot, President of the Descartes Grand Jury.

Intellectual property as main issue

This year's theme at the award ceremony has been intellectual property. Keynote speakers from "Max Planck Institute for Intellectual Property, Competition and Tax Law", "Ventratec-Spin-off of Fraunhofer Patent Centre" and the "OECD" highlighted the importance of intellectual property for European researchers. "Indeed, patents are the only way for researchers to protect their findings and exploit them commercially to the benefit of society", explained Mr. Kyriakides, Vice-President of the European Patent Office, Munich. European researchers increasingly understand the importance of patenting. Only in 2001, the European Patent office received 158,200 applications for European patents, which is an increase of 9% over the previous year.

Next call for proposals 2003 planned on 17 December 2002

Now entering its third year, the prize represents an important opportunity for European scientists to gain the public acclaim they deserve. Information concerning project presentation and entries can be found on the web-site under www.cordis.lu/descartes.

Further media information:

Should you like more information on this year's Descartes Prize, on past projects or submissions, please contact:

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The Descartes Prize is a part of the Research Directorate General's Improving the Human Research Potential Programme (1998-2002): www.cordis.lu/improving/home.html

The Descartes Prize website: www.cordis.lu/descartes

Towards new drugs for Multiple Sclerosis patients

The discovery by the international team of researchers from Denmark, England, Scotland, Sweden and the USA is making a major contribution to the understanding of a chronic inflammatory degenerative disease of the nervous system – Multiple Sclerosis (MS). MS is widely held to be an autoimmune disease, in which the body's own immune system attacks the central nervous system. Through their experiments, the team successfully defined the principal culprits in the autoimmune attack and visualised how the virus may start a disease. The researchers' ultimate objective is to develop new drugs and immunomodulatory therapies, which are urgently needed for the treatment of MS patients.

Multiple sclerosis is one of the most common diseases of the nervous system, afflicting at least 350,000 people in Europe. It is a long life-disabling disease for which there is no curative treatment. It usually causes sudden neurologic symptoms including vision loss, paralysis, numbness, and walking difficulties. The symptoms can be diverse and confusing, often appear only sporadically, making it difficult to diagnose, even today. While the exact cause of MS is unknown, most researchers believe that the damage to myelin (a fatty tissue which surrounds and protects the nerves of central nervous system) results from an abnormal response by the body's own immune system[1].

The researchers successfully unravelled the immunological basis of the disease. The breakthrough discovery not only identified targets of the immune system in the brains of MS patients but it also described a new mechanism, explaining how MS causes immune cells to escape the normal control mechanisms in the body. They visualised how a virus component can mimic a component of the central nervous system, thereby deceiving immune cells to attack this component and trigger the disease.

In order to progress further and faster in their research, the team developed a transgenic mouse possessing some of the disease's associated genes of the human MS patients. The mouse model is already being used in testing and developing new immunomodulatory therapies that will benefit MS patients.

This research provides an important platform for the development of new drugs. The team is currently working with European pharmaceutical partners on developing new medicines, some of which are already being tested. Several companies have expressed interest in obtaining access to the project's results. In addition, other scientists and companies are using the results and reagents to develop new therapies as well as to investigate autoimmunity of MS.

The outstanding scientific research of this international partnership is the product of successful transnational co-operation. Complementary and multidisciplinary expertise and resources were integrated in a fruitful way that clearly exceeded the potential of the individual teams.

Project co-ordinated by Prof. Lars Fugger from Aarhus University Hospital , Århus (Denmark) in co-operation with research teams from Copenhagen University Hospital and the Danish School of Pharmacy (Denmark), Lund University (Sweden), Dundee University (Scotland), Oxford University (England) and Albert Einstein College of Medicine (USA).

[1] Normally, the immune system defends the body against foreign invaders. However, in autoimmune disease the body attacks its own tissue – myelin. Parts of some viruses look so much like normal human tissue that white blood cells, known as "T cells", will inadvertently attack the latter when they attack the virus. This is yet another mechanism by which viral infections could lead indirectly to destruction of myelin.

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The universe's biggest explosions since the Big Bang

The research conducted by scientists from the Netherlands, Italy, Denmark, Spain, the UK and Germany confirmed theoretical predictions that gamma-ray bursts (GRBs) are the most powerful explosions in the universe, second only to the Big Bang. They emit high energy radiation and originate in very distant galaxies, where stars form at a prodigious rate. New clues support what were once speculations that bursts represented the explosive death of massive stars. The GRBs may become unique probes of extreme physics and cosmology, allowing astronomers to trace the history of star formation in the early cosmos.

Gamma Ray Bursts belong to the most mysterious phenomena in the Universe, along with the nature of dark matter and the cosmological constant. The story of their discovery is an excellent example of a significant progress achieved in scientific research. The GRBs were first spotted in 1967 by US military satellites. A systematic search for them began in 1991, when NASA's Compton Gamma Ray Observatory (CGRO) was launched and began detecting GRBs at a rate of about one per day. Even then their origin remained mysterious because gamma ray detectors had very low positional accuracy and the bursts faded fast.

That changed in 1996 with the launch of the Italian/Dutch satellite BeppoSAX. Thanks to the unique multi-faceted capabilities of the satellite, the team of European scientists solved what has been one of the greatest mysteries of astrophysics for 30 years - the places of origin of the GRBs. The BeppoSAX team provided the scientific community with accurate and rapid locations of GRBs and in 1997 discovered that GRBs keep glowing in X-rays for several days. Astronomers of the University of Amsterdam confirmed that the same is true in optical light. This led to the discovery that the cosmic bursts originate in very distant galaxies, at the edge of the observable Universe (between 5 and 12 billion light years away, for an assumed age of the Universe of 13 billion years).

Another breakthrough came in 1998. While Amsterdam astronomers were observing one of the GRBs they also caught, for the first time, a stellar explosion simultaneous with the initial gamma ray burst. This observation provided the researchers with fresh clues. It was subsequently discovered that a sizeable fraction of the GRBs is related to very powerful stellar explosions, so-called "hypernovae", which presumably mark the final core collapse of very massive stars. The exploding stars are among the main producers of all elements heavier than helium in the Universe. These elements enrich the interstellar hydrogen and helium clouds in the galaxies, which themselves originated in the Big Bang. Consequently, from the enriched clouds new stars and planets are formed. The giant stellar explosions that we observe now as GRBs took place in the early universe. Nonetheless, similar explosions must have taken place in our own galaxy and long ago formed the chemical elements which now compose our bodies: carbon, oxygen, calcium, iron, etc. We, as human beings, would not have existed without the occurrence of the giant stellar explosions that we observe as GRBs. The European collaborative nature of the project was indispensable for all these discoveries. The BeppoSAX is an Italian/Dutch satellite and the optical follow ups were performed by astronomers from six different EU countries, using worldwide observatory networks. The necessary combined expertise and equipment is not available singularly within Europe and thus the close co-operation between the international teams was crucial to the success of the project.

The findings of this scientific research may be very important cosmic probes of extreme physics and cosmology, enabling astronomers to trace the history of star formation in the universe.

Project co-ordinated by Dr. Edward Van den Heuvel from the University of Amsterdam (the Netherlands) in co-operation with research teams from the University of Amsterdam, SRON (the Netherlands), NASA/MSFC (USA), CNR/IASF in Roma, INAF Trieste and the University

of Ferrara (Italy), the University of Copenhagen (Denmark), LAEFF-INTA (Spain), Cambridge University (the UK) and Astrophysical Institute Potsdam (Germany).

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