TAF TECHNOLOGY ACADEMY FINLAND

AWARDING THE MILLENNIUM TECHNOLOGY PRIZE

PHYSICIST STUART PARKIN WINS 2014 MILLENNIUM TECHNOLOGY PRIZE FOR OPENING BIG DATA ERA

Live stream of the announcement event of the 2014 Millennium Technology Prize winner can be watched at www.technologyacademy.fi on April 9th, 2014 at 11.30 – 13.30 EET. #2014millenniumprize.

Technology Academy Finland (TAF) has today declared innovator **Prof. Stuart Parkin** as winner of the 2014 Millennium Technology Prize, the prominent award for technological innovation. The winner, who follows in the footsteps of past winners such as World Wide Web creator **Sir Tim Berners-Lee** and ethical stem cell pioneer **Dr. Shinya Yamanaka**, will be honoured at a ceremony in Helsinki, Finland, on Wednesday 7 May 2014.The prize is worth one million euros.

Prof. Parkin receives the 2014 Millennium Technology Prize in recognition of his discoveries, which have enabled a thousand-fold increase in the storage capacity of magnetic disk drives. Parkin's innovations have led to a huge expansion of data acquisition and storage capacities, which in turn have underpinned the evolution of large data centres and cloud services, social networks, music and film distribution online.

We can now stream movies, use social media and search information on the internet because all that information is stored in magnetic disk drives in the cloud. The information is stored in disk drives, because it is a cost-efficient means of storing data thanks to the spintronic device. Parkin cites estimates that a month's supply of disk drives could easily store all the information known since the beginning of mankind.

Basically all this information is available in the cloud due to this little spintronic device that allows us to read it. Our contemporary online world is largely possible because of these atomically-thin magnetic structures.

Successful field of nanotechnology

Professor Parkin's discoveries rely on magneto-resistive thin-film structures and the development of the giant magnetoresistance (GMR) spin-valve read head. Following the discovery of GMR in 1988, Parkin rapidly transformed this scientific observation into a practical data storage technology.

Parkin is a leading innovator in the field of spintronics, which relies on the magnetic spin of electrons rather than their charge to store bits, and is one of the most successful fields of nanotechnology yet. Another key spintronics advance is magnetoresistive random-access memory (MRAM), which Parkin

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proposed in 1995. This technology is based on magnetic tunnel junction (MTJ) memory cells. The MTJ, a close cousin of the GMR spin valve, has become standard in hard disk drive read heads.

Prof. Parkin said:

"I am extremely happy and excited to have won the Millennium Technology Prize because of course it's one of the most important prizes in the scientific community. It has been awarded to some really great scientists over the past decade. The previous winners have proven to be fantastic scientists whose research has had tremendous impact. I am very humbled and proud to have been awarded the prize, which is s a tremendous validation by the scientific community of my work and its impact on the world as a whole."

What the selection committee said about this year's Winner:

"Professor **Stuart S.P. Parkin** (Ph.D) is awarded the Millennium Technology Prize for his pioneering contribution to the science and application of spintronic materials, his work leading to a prodigious growth in the capacity to store digital information. Parkin's achievements have greatly facilitated the occurrence of the 'big data' revolution and significantly transformed human access to knowledge."

Dr. Tech. Juha Ylä-Jääski, President of Technology Academy Finland, said:

"Technology Academy Finland is proud to be able to award the 2014 Millennium Technology Prize to Prof. Stuart S.P. Parkin and his innovations leading to a revolutionary growth in digital information storage capacity. Prof. Parkin's innovations represent the true spirit and every aspect of the Millennium Technology Prize: groundbreaking innovations opening up possibilities to totally new services which address a large audience and improve the quality of life. Furthermore, in the future Prof. Parkin's innovations may pave the way to a totally new era in computing with dramatically increased capacity and reduced power consumption."

Stuart Parkin is an IBM Fellow, consulting professor at Stanford University, visiting professor at four other universities, Director of the Max Planck Institute of Microstructure Physics and Alexander von Humboldt Professor at Martin Luther University, Halle-Wittenberg.

The Millennium Technology Prize is Finland's tribute to life-enhancing technological innovation. The prize is awarded every second year for a technological innovation that significantly improves the quality of people's lives, today and in the future. It is awarded by the Technology Academy Finland (TAF), an independent foundation established by Finnish industry, in partnership with the Finnish state. The winner of the prize is selected by the Board of TAF on the basis of recommendations made by the International Selection Committee, a distinguished network of leading Finnish and international scientists and technologists. The Grand Prize Winner will be honoured at a festive ceremony in Helsinki on 7 May 2014.

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Notes to editors:

1. For international media enquiries, please contact:
Rob Blackhurst Apollo Public Relations rob@apollopublicrelations.com +44 787 9423341

2. For Finnish media enquiries, please contact:
Niina Suhonen, Head of Communications & Marketing, Technology Academy Finland
firstname.lastname(at)technologyacademy.fi +358 40 8439 438

3. Contacts at Technology Academy Finland
Dr. Tech. Juha Ylä-Jääski, President and CEO
firstname.lastname(at)technologyacademy.fi +358 40 903 0606
Chancellor Jarl-Thure Eriksson, Åbo Akademi University, Chair of the International Selection Committee, firstname.lastname(at)abo.fi +358 40 5012 570

Live stream of the announcement event of the 2014 Millennium Technology Prize winner can be watched at www.technologyacademy.fi on April 9th, 2014 at 11.30 – 13.30 EET.

The recording of the event will be available as of April 10 at
http://www.youtube.com/user/millenniumprize

Press kit with video and photographs of Stuart Parkin
www.technologyacademy.fi

Stuart Parkin videos online
https://www.youtube.com/watch?v=cID4fKraWkE
http://online.kitp.ucsb.edu/online/plecture/sparkin13/rm/flashtv.html
http://video.mit.edu/watch/tr10-racetrack-memory-545/

Further information about the Millennium Technology Prize and members of the International Selection Committee at: www.millenniumprize.fi

Previous winners
The inaugural Prize was awarded in 2004 to **Sir Tim Berners-Lee**, inventor of the World Wide Web. In 2006, the Prize was awarded to Professor **Shuji Nakamura**, inventor of revolutionary new light sources - bright blue, green and white LEDs and a blue laser. In 2008, Professor **Robert Langer** won the Prize for his innovative work in controlled drug release and for developing innovative biomaterials for use in tissue regeneration. The fourth Prize was awarded to Professor **Michael Grätzel** in 2010 for his innovative developments in dye-sensitised solar cells. In 2012, Prizes were awarded to **Linus Torvalds i**n recognition of the unprejudiced creation of a new open source operating system leading to the widely-used Linux kernel and **Dr. Shinya Yamanaka** in recognition of the discovery of a new method to produce induced pluripotent stem cells from ordinary cell tissue.

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More about previous winners and their innovations:
Case stories, interviews, photographs and videos on the laureates are available at www.millenniumprize.fi

Partners of the Millennium Technology Prize
Aalto University, FIM, Kemira, Kone, Metso, Neste Oil, Nokia, Outotec, SEB, Vaisala

Technology Academy Finland (TAF) is an independent foundation promoting innovations that improve the quality of people's lives in a sustainable manner. TAF awards the biennial Millennium Technology Prize and runs associated events such as the Millennium Youth Camp. TAF also promotes Finland as a high tech, Nordic wellbeing country by actively participating in global networks within the scientific community, business and governmental organizations.

TAF incorporates the Finnish Academy of Technology, the Swedish Academy of Engineering Sciences in Finland and the Industry Council, which represents leading Finnish companies. One of TAF's strengths is the tripartite cooperation between industry, governmental organizations and the scientific community and its extensive network in all these sectors. The three sectors are also represented in the TAF Board and the Executive Committee.

Additional information about Technology Academy Finland at:
www.technologyacademy.fi