

# Breakthrough Prize awards scientists \$22 million and star status

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Lights. Camera. Science.

In a scene out of Hollywood, researchers and celebrities will gather in an ornately choreographed fete in a NASA Ames hangar in early November to celebrate \$22 million in prizes for discoveries in math, physics and the life sciences.

The winners of the Breakthrough Prize, announced on Wednesday in advance of the Nov. 4 event, include some of the top thinkers in their fields.

Their discoveries include high-resolution imaging technologies, a new class of drugs, chromosomal disease, innovations in cryptography and a new type of electrical-conducting materials.

The prizes are among the biggest payouts in science. Conceived by theoretical physicist and entrepreneur Yuri Milner, the Breakthrough Prize Foundation aims to create a cultural shift—if scientists are toasted like celebrities, they'll win greater public attention.

Brainiacs will be celebrated in a self-consciously glittery, grand and prestigious event, hosted by actor Pierce Brosnan, where they'll rub shoulders with movie stars and tech titans. In previous years, guests included actors Morgan Freeman, Mila Kunis and Ashton Kutcher, as well as Spotify co-founder and CEO Daniel Elk, YouTube CEO Susan Wojcicki, Udacity co-founder Sebastian Thrun and Virgin Galactic's George Whitesides.

Since the inception of the Breakthrough Prize in 2012, more than \$200 million has been awarded to honor critical research.

The prize is funded by Milner and his wife, Julia, Chinese entrepreneur Ma Huateng and several Silicon Valley tech titans: Anne Wojcicki, of 23andMe; Sergey Brin, of Google and Facebook CEO Mark Zuckerberg and his wife, Dr. Priscilla Chan, a pediatrician at UC San Francisco.

Winners in [life sciences](#):

- C. Frank Bennett and Adrian R. Krainer of Ionis Pharmaceuticals and Cold Spring Harbor Laboratory, respectively, for the development of a therapy for children with the neurodegenerative disease spinal muscular atrophy, a rare but devastating disease.
- Angelika Amon of Massachusetts Institute of Technology and Howard Hughes Medical Institute for determining the consequences of an abnormal chromosome number, a disorder called aneuploidy.
- Xiaowei Zhuang of Harvard University and Howard Hughes Medical Institute, who discovered hidden structures in cells by developing super-resolution imaging—a method that transcends the limits of light microscopy. She earned her Ph.D. at UC Berkeley and did postdoctoral studies at Stanford University.
- Zhijian "James" Chen of University of Texas Southwestern Medical Center and Howard Hughes Medical Institute who learned how DNA triggers immune and autoimmune responses from the interior of a cell.

Winner in fundamental physics:

- Charles Kane and Eugene Mele of the University of Pennsylvania for new ideas about topology and symmetry in physics, leading to the prediction of a new class of materials that conduct electricity only on their surface.

Winner in math:

- Vincent Lafforgue of Europe's National Center for Scientific Research and Institut Fourier, Universite Grenoble Alpes, for ground-breaking contributions to several areas of mathematics, in

particular to the Langlands program in the function field case.

In addition, there were six smaller "New Horizons" prizes of \$100,000 each for early-career researchers in physics and math. One recipient is 34-year-old Aron Wall of the Stanford Institute for Theoretical Physics, who studies black hole thermodynamics and quantum gravity. He's the son of computer scientist Larry Wall, who created the Perl programming language.

Last month, the foundation announced a Special Breakthrough Prize in Fundamental Physics recognizing the British astrophysicist Jocelyn Bell Burnell for her discovery of pulsars, a detection first announced in February 1968, and her scientific leadership over the last five decades. She donated her \$3 million [prize](#) money to efforts that help women, ethnic minority, and refugee students study physics

The winners are chosen by a committee of the previous year's winners.

The ceremony will be broadcast live on Sunday, Nov. 4, at 7 p.m. on National Geographic, and will be streamed live via Facebook and YouTube on National Geographic TV (Facebook / YouTube) and Breakthrough Prize (Facebook / YouTube).

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