Garik Israelian

STARMUS

Awards

Nominated by Swiss Academy of Sciences, Israelian, Michel Mayor (co-laureate of the 2019 Nobel Prize in Physics) and Nuno Santos were awarded the 2010 Victor Ambartsumian International Prize for Astrophysics, Physics or Mathematics (39,40) .

In 2014, Israelian received The Canary Islands Gold Medal awarded by the Government of Canary Islands. This is the highest recognition of the Canary Islands Government awarded to people or companies for efforts for the benefit of the Canary Islands society (41,42)

On 20 June 2016 the International Astronomical Union and the Minor Planet Center officially renamed asteroid 21057(1991 GJ8) to Garik Israelian in honor of Israelian (44, 44). The citation was written by astronomer Joel Parker and Queen guitarist Brian May, and presented by them at the Starmus Festival III in 2016 (45).

Garik Israelian (born 1963 in Yerevan, Armenia) is astrophysicist and co-founder of the Starmus Festival (1,2,3). In 1999 Dr. Israelian and colleagues presented the first observational evidence that supernova explosions are responsible for the formation of stellar-mass black holes (4,5).

Career

Israelian graduated from Yerevan State University in 1987 with a First Class Honors degree in Physics, and completed his PhD in 1992. His PhD and first articles were dedicated to radiation transfer theory (6,7,8). Israelian worked as a post-doctoral researcher at the Universities of Utrecht (The Netherlands), Brussels (Belgium), and Sydney (Australia) (1,2,3). Since 1997, Israelian works at the Institute of Astrophysics of Canary Islands (IAC) in Tenerife, Canary Islands, Spain (3). He is a Principal Investigator of the project Observational Tests of the Processes of Nucleosynthesis in the Universe. The IAC is an international center of astrophysics which operates the largest optical telescope in the world – Gran Telescopio Canarias (GTC) as well as two observatories on Tenerife and La Palma. He was a visiting professor at Caltech (2002), University of Geneva (2001) and National Astronomical Observatory of Japan and the University of Tokyo (2003). Israelian lectured 32 hours of post-graduate courses on Radiation Transfer in Stellar Atmospheres at the Universities of Geneva and Tokyo. He supervised several PhD dissertations.

He led several important findings in the field of massive stars, such as magnetic loops in the atmosphere of Rigel (10), fast variations in the atmosphere of P Cygni (11), and evolutionary changes of the galactic hypergiants HR8752 and Rho Cassiopeia (12, 13). He dedicated many years of investigations to studies of the chemical evolution of the Galaxy, properties of stars with extra-solar planets and, low-mass x-ray binaries. Dr. Israelian carried out many observational campaigns with various telescopes in Canary Islands, Hawaii and Chile. Israelian has published around 500 articles with more than 10.000 citations (9) on subjects ranging from the extrasolar planets and their parent stars, massive super-giant stars, metal-poor stars to low-mass x-ray binaries with black holes and neutron stars.

Two hundred years after the original idea by John Michell regarding the existence of black holes in the Universe, Israelian led an international collaboration based on spectral data collected with the 10m Keck telescope in Hawaii, which provided the first observational evidence that supernova explosions are responsible for the formation of black holes (4,5). The black hole binary system studied by Israelian and colleagues was GRO J1655-40. This discovery was cited by Stephen Hawking in his lecture at Starmus in 2014 (14, 15). It has also been cited in the millennium review of Black Holes by Dennis Sciama (PhD supervisor of Stephen Hawking) (16). This finding has led to the well-known model developed by Gerry Brown, Hans Bethe (Nobel Laureate physicist), Garik Israelian and collaborators to explain the mechanism responsible for the formation and phenomena of Gamma Ray Bursts (17).

In 2001 Israelian proposed the so-called "Lithium-6 test" aiming to check if a star has engulfed a planet or other gaseous or solid matter (14). He and collaborators proposed that a solar-type star HD82943 with two giant planets has swallowed a massive planet or a large amount of small rocky matter (18,19, 20). In 2009 a team of scientists led by Israelian has provided the explanation of anomaly low abundance of lithium in the atmosphere of the Sun and linked this fact with the presence of planets in the solar system (21, 22). They proposed that stars with planets, such as the Sun, tend to have much less lithium. (23)

Dr. Israelian gave more than 60 presentations at international conferences and symposia. In 2009 he was invited to speak at TED Global in Oxford (24). In June 2016, Israelian appeared on Larry King Now with Stephen Hawking to discuss Starmus Festival and extrasolar planets (25).

Science Communication

Starmus Festival (www.starmus.com)

In 2010 Dr. Garik Israelian and Dr. Brian May founded the Starmus Festival described as an “Out-of-this-world festival” of science and arts (33, 34). Brian May credits Israelian in his PhD thesis as "... my prime collaborator in resuming this work ... more than anyone else responsible for helping me through the final stages of this PhD work". (35, 36). The Starmus International Festival is a global gathering focused on celebrating astronomy, space exploration, music, art, and allied sciences such as biology and chemistry. Since 2010 the advisory board of Starmus included Garik Israelian, Brian May, Stephen Hawking, Alexei Leonov, Peter Gabriel, Richard Dawkins, Tony Fadell, Jill Tarter, Jack Szostak (Nobel laureate), Harry Kroto (Nobel Laureate), Robert Williams, David Eicher and Emmanuelle Charpentier (Nobel Laureate). The six editions of the festival held so far featured Apollo astronauts, including Neil Armstrong, Buzz Aldrin, Jim Lovell, Harrison Schmitt, Charlie Duke, scientists Richard Dawkins, Stephen Hawking, Kip Thorne, Elizabeth Blackburn, musicians Brian May, Hans Zimmer, Brian Eno, Steve Vai, Sarah Brightman, Graham Gouldman, Serj Tankian, Rick Wakeman among others.

In 2015 STARMUS Festival and Stephen Hawking created “The Stephen Hawking Medal for Science Communication” (37, 38). The medal was designed by Brian May and Alexei Leonov.

The Sounds of Stars

In 2005, Garik Israelian compiled a unique library of acoustic sound waves produced within the bodies of stars. This research project inspired Dr. Israelian to join forces with Dr. Brian May, astrophysicist and legendary guitarist of Queen, to create a new festival that would bring the stars together with music, and so Starmus was born (26). The main concept of the "Starsounds" project was explained in the lecture of Israelian "Our Acoustic Universe" and published in the book "50 Years of Man in Space" (lectures of Starmus I, edited by Israelian and Brian May, 2014) (27,28). "Starsounds" have been used by Brian May and Tangerine Dream in their composition "Supernovae" (29). In 2016 Garik Israelian made a selection from his library of stellar recordings and turned them over to Brian Eno who arranged them into a new composition. Dr. Israelian invited Paul Franklin and Oliver James of DNEG, the world-leading Oscar winning film visual effects studio, to create a video that responded to the mysterious promise of the music. The result is "Starsounds", a hypnotic piece rich with complex harmonies and mesmerizing visuals. "Starsounds" is available on the internet for the first time as a joint project by Dr. Israelian, Brian Eno, Paul Franklin, Oliver James, and DNEG (30, 31, 32).

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