

CURRICULUM VITAE

Prof. Irakli Simonia

Country of Citizen: Georgia

Education: He graduated physics and mathematics department of Tbilisi State Pedagogical University in 1985, with MS in physics; defended the thesis on astrophysics of comets at Georgia Academy of Sciences in 1998. He has PhD degree.

Place of work, position: In 1986-1988 he worked at the Young People's Center of Georgia as a lecturer of astronomy. In 1988-2008 he worked at Abastumani Astrophysical Observatory as a researcher. Since 2008 he is an Associate Professor of Astronomy at the School of Natural Sciences and Medicine of Ilia State University, Georgia. During 2009 – 2014 he was an adjunct professor at James Cook University, Australia.

Scientific activity

Astrophysics: Dr. Irakli Simonia investigated the dynamics of cometary atmospheres with a change of their heliocentric distances using the isophotometric atlas of comets and the "Compression-size" method. He proposed a strategy for space research of short-period comets - triple sounding. He studied the statistics of the appearance of short-period comets and revealed a correlation of their appearance with a fall of the iron meteorites. He invented the method of luminescence microstructurography and applied it to individual samples of the iron meteorite "Sikhote-Alin". He revealed the surface microstructure of sections of iron meteorites in the form of caverns and microcracks. This invention belongs to the field of technical physics (Georgia Patent 404). He studied the properties of cometary nuclei, described some photochemical processes on the surfaces of the icy satellites of the giant planets. He developed a new theory of photoluminescence of cometary ice and dust; Developed a new model of frozen hydrocarbon particles of cometary atmospheres; Described the properties of these particles in the form of icy micrograins - frozen mixtures of aromatic and aliphatic hydrocarbons, and applied this theory and model to the study of ice of comets 122P/de Vico, 153P/Ikeya-Zhang, 19P/Borrelly, etc. He demonstrated that previously unknown, unidentified emissions of optical spectra of comets represent the photoluminescence of the frozen hydrocarbon particles of the icy cometary halo; He developed also a new theory of thermoluminescence of solid cometary matter, including carbonaceous dust. He investigated (together with his colleagues) cathodoluminescence of the pre-solar grains – nanometric minerals of the meteorite substance within the interests of the problem of the origin and evolution of cometary and nebulae dust. He demonstrated (together with a co-author) that the frozen hydrocarbon matter of comets, including relict matter, may contain prebiotics or their structural analogues, which luminesce under the influence of external factors. Dr. Simonia developed (together with a co-author) a new theory of visible reddening of Trans-Neptunian Objects, explaining this phenomenon by double scattering of sunlight by nanometric dust of an ecliptic dust cloud. He developed a new model of frozen hydrocarbon particles for interstellar and circumstellar matter, explored the nebula CED 201 and revealed in its dust matter existence of frozen hydrocarbon particles of various compositions; Demonstrated that previously unidentified emissions of the optical spectra of this nebula represent the photoluminescence of a complex organic. He developed a new theory explaining a mechanism of the formation of diffuse interstellar bands in the spectra of galactic objects - a phenomenon of interstellar quasiline absorption. He identified over 28% of the previously unidentified diffuse interstellar bands. He proposed a concept of a new optical filter in the form of a frozen polycrystalline mixture of hydrocarbons. All these new theories and the results have been published.

Ancient Astronomy: The investigations conducted by Dr. Irakli Simonia in the field of ancient astronomy cover both the history of astronomy and archaeoastronomy. In particular, he investigated the development of astronomical knowledge of the Age of enlightenment in Western Europe; investigated the development of the cosmological worldview and astronomical knowledge in the ancient Georgia during the period of 16th century BC - 18th century AD. He studied (together with co-authors) the possible astronomical significance of some architectural complexes in Georgia of the period of antiquity and the medieval written ethnoastronomical materials. He proposed (together with co-authors) a concept of "solar stations" as megalithic multifunctional complexes of ritual, observational, and calendar significance; described (together with co-authors) some astronomical monuments of the Caucasian region. He investigated a number of Georgian astronomical manuscripts and published (together with co-authors) an e-book - a

scientific database on astronomical manuscripts in Georgia. He studied astronomical manuscript “Star book” and published the special monograph “The Astronomical Significance of the Manuscript Star book.” All these new concepts and the results have been published.

Academic activity:

Dr. I.Simonia leads the following courses for PhD students: a) The Course of Astronomy; b) Molecular Astrophysics and Cosmochemistry; c) Archaeoastronomy and Cultural Astronomy.

Publications: Dr. I.Simonia is author of more than 85 scientific papers in fields of astronomy, astrophysics, cosmochemistry, the history of astronomy, and archaeoastronomy.

Grants and Fellowships:

2001 –DAAD, Germany.

2003-2005 Georgia Academy of Sciences.

2005 –DAAD, Germany.

2009-2011 USAID.

2012-2015 Rustaveli National Science Foundation.

Honor: Minor planet 124398 Iraklisimonia, discovered by Roy Tucker in 2001, was named in Irakli Simonia honor.

International Organizations:

International Astronomical Union

American Astronomical Society

International Society of Astronomy in Culture

European Society of Astronomy in Culture

Foreign Languages: English, Russian, (excellent).