Vardan Elbakyan

Research Assistant

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Employment

Faculty of Physics, University of Duisburg-Essen — *Duisburg, Germany*
Research Assistant — *Oct. 2023 - Present*

School of Physics and Astronomy, University of Leicester — *Leicester, UK*
Research Associate — *Nov. 2020 – Oct. 2023*

Research Institute of Physics, Southern Federal University — *Rostov-on-Don, Russia*
Senior Research Fellow — *Jan. 2020 - Nov. 2020*
Research Fellow — *Sep. 2017 – Dec. 2019*
Junior Research Fellow — *Jul. 2014 - Sep. 2017*
Lab Assistant — *Sep. 2012 – Nov. 2013*

Research Experience

Lund Observatory, Lund University — *Lund, Sweden*
Visiting Postdoctoral Fellow *(Host: Prof. Anders Johansen)* — *Mar. 2019 - Jun. 2020*

Institute of Astrophysics, University of Vienna — *Vienna, Austria*
Visiting Postdoctoral Fellow *(Host: Prof. Manuel Güdel)* — *Mar. 2018 - Aug. 2018*

Department of Physics and Astronomy, University of Kyoto — *Kyoto, Japan*
Visiting Research Fellow *(Host: Prof. Takashi Hosokawa)* — *Sep. 2016*

Institute of Astrophysics, University of Vienna — *Vienna, Austria*
Visiting Research Fellow *(Host: Prof. Manuel Güdel)* — *Oct. 2015 - Feb. 2016*

Department of Astrophysics, University of Exeter — *Exeter, UK*
Visiting PhD Student *(Host: Prof. Isabelle Baraffe)* — *Sep. 2014*

Education

Research Institute of Physics, Southern Federal University — *Rostov-on-Don, Russia*
Doctor of Philosophy (PhD) — *2013 - 2017*
Dissertation title: *Influence of mass accretion on early evolution of (sub)-solar mass stars*
Advisor: *Dr. Eduard Vorobyov*

Department of Space Physics, Physics Faculty, Southern Federal University — *Rostov-on-Don, Russia*
Master of Science and Education (MScEd) /Summa Cum Laude/ — *2011 - 2013*
Dissertation title: *Dynamics of galactic wind*
Advisor: *Dr., Prof. Yuri Shchekinov*

Department of Astrophysics, Physics Faculty, Yerevan State University — *Yerevan, Armenia*
Bachelor of Science and Education (BScEd) — *2007 - 2011*
Dissertation title: *Irradiation changes during the solar wind evolution*
Advisor: *Dr. Ararat Yeghikyan*

Publications (Scopus/WoS, peer-reviewed)

31 publications in peer-reviewed international journals (Scopus/WoS), **7** as the first author, **20** as either the 2nd or 3rd author, with a total of **568** citations (Sep 2024). H-index: **15.** See the publication list at the end or at Smithsonian/NASA ADS.

Grants/Scholarships

- **2022-2024:** Grant for computing time on the STFC DiRAC facility for the project "Circumstellar disk evolution and planet formation" (as co-PI), 1.82 Mcore-h
- **2020-2023:** Joint Austrian-Russian (FWF-RFBR) research grant "*Numerical modeling of the initial stages of star and planet formation on massively parallel supercomputers*" (as co-PI), 120k EUR
- **2019-2021:** Joint Russian-Taiwanese (RFBR-MOST) research grant "*Outbursting stars as a key to understanding the early stages of star and planet formation*" (as co-PI), 75k EUR
- **2019:** Visby scholarship from The Swedish Institute (SI) for the project "*The evolution of gaseous and dusty circumstellar disks at the early stages of planet formation*", 25k EUR
- **2018:** Ernst Mach Postdoctoral scholarship from the Austrian Academic Exchange Service (OeAD) for the project "*The early evolution of young accreting stars with different metallicities*", 6.900 EUR
- **2017-2019:** Grant from Russian Science Foundation (RSF) for the project "*The evolution of gaseous and dusty circumstellar disks at the early stages of planet formation*" (as co-PI), 200k EUR
- **2017-2019:** Grant from Ministry of Science and Higher Education of the Russian Federation for the project *"The study of star and planet formation at the various stages of universe evolution"* (as co-PI), 65k EUR
- **2015:** Ernst Mach PhD scholarship from the Austrian Academic Exchange Service (OeAD) for the project "*Numerical simulations of protostars and protostellar discs*", 5.250 EUR
- **2014-2016:** Grant from Ministry of Science and Higher Education of the Russian Federation for the project "*Star formation processes in the Milky Way galaxy and the nearest intergalactic space*" (as co-PI), 175k EUR

Teaching experience

- **2024/25 WS:** Exercise group leader (Übungsgruppenleiter) in Statistical Physics of Complex Systems – Bachelor
- **2023/24 SS:** Physics Lab course for International Studies in Engineering (ISE)
- **2023/24 WS:** Exercises on the mathematical methods 3 (Übungen zu den Mathematischen Methoden 3) – Bachelor – Energy Science
- **2022**: Supervision of literature review project: *Anya Sier* (University of Leicester)
- **2022-2024:** Co-supervision of PhD students: *Sandra Calovic* and *Yinhao Wu* (University of Leicester)
- **2021-2022:** Co-supervision of 4th Year undergraduate research projects: *Dakin, Henry C.H.* (FU Ori type outbursts), *Musk, Jack* (Star and planet formation), School of Physics and Astronomy, University of Leicester
- **2020:** Theoretical and practical courses in *"General Astronomy"*, College of applied vocational education, Southern Federal University

Oral talks at Conferences/Workshops/Seminars (selected)

Sep. 2024	**Born in Fire: Eruptive Stars and Planet Formation** *(online)*	*Santiago, Chile*
Aug. 2024	**IAU GA – Division F Meeting** *(online)*	*Cape Town, South Africa*
Jan. 2024	**Rocky Worlds III**	*ETH Zürich, Switzerland*
Sep. 2022	**Planet and binary formation in gravitationally unstable protoplanetary discs in the high-resolution era**	*UoL, Leicester, UK*
Aug. 2022	**NCTS-ASIAA Workshop - Stars, Planets, and Formosa** *(online)*	*NTU, Taipei, Taiwan*

Aug. 2022	**IAU GA 2022 – Division G Meeting** *(online)*	*BEXCO, Busan, Republic of Korea*
Jan. 2022	**Modelling of Disc Fragmentation, Planet Migration and Episodic Accretion** *(invited)*	*University of Leicester, Leicester, UK*
Oct. 2021	**"STAR FORMATION: FROM CLOUDS TO DISCS"**	*Dublin Institute for Advanced Studies, Dublin, Ireland*
Aug. 2021	**"VAK-2021"** *(online)*	*Moscow State University, Moscow, Russia*
Dec. 2020	**Accretion and luminosity bursts across the stellar mass spectrum** *(online, invited)*	*Southern Federal University, Rostov-on-Don, Russia*
Nov. 2020	**Astrophysical seminar** *(online, invited)*	*Konkoly Observatory, Hungary*
Jun. 2019	**"From Stars to Planets II"**	*Chalmers University of Technology, Gothenburg, Sweden*
Aug. 2018	**IAU Symposium 345: "Origins: From the Protosun to the First Steps of Life"**	*University of Vienna, Vienna, Austria*
Sep. 2017	**"Stellar associations: 70 years of research"**	*Byurakan Astrophysical Observatory, Armenia*
Oct. 2016	**"Stars: from collapse to collapse"**	*Special Astrophysical Observatory, Russia*
Sep.-Dec. 2013	**International Symposium (trimester) "N body gravitational dynamical systems from n = 2 to infinity ..."**	*Institute Henri Poincare, Paris, France*

Organizational skills

- **Member of Local Organizing Committee at:**

Sep. 2022	**Planet and binary formation in gravitationally unstable protoplanetary discs in the high-resolution era**	*UoL, Leicester, UK*
Mar. 2021	**Dynamical and chemical evolution of protoplanetary discs**	*Online workshop*
Dec. 2020	**Accretion and luminosity bursts across the stellar mass spectrum**	*Online workshop*
May 2012	**Galaxies: Origin, Dynamics, Structure**	*Sochi, Russia*

- **Organization of weekly Astrophysics Seminars at University of Leicester**

Outreach

Nov. 2018	**Public talk "Supernovae: Cruel and mysterious"**	*https://youtu.be/9xy0fQZlZwY*
Aug. 2018	**Podcast talk on "General topics in astronomy"**	*https://oead.at/en/news/article/2018/08/aal-16-alumni-audiolab-with-vardan-elbakyan*
Nov. 2017	**Public talk "Exoplanet Hunt"**	
Apr. 2016	**Public talk "Personal life of stars"**	*https://youtu.be/bnNY1KxTiV0*
Jul. 2015	**Public talk "Evolution of Universe: to infinity and beyond"**	*https://youtu.be/L_o6h7dvcfQ*

Refereeing

Iraqi Journal of Science	*Since 2023*
Baghdad Science Journal	*Since 2023*
ApJ	*Since 2020*
Astronomy Reports	*Since 2018*

Professional Membership

International Astronomical Union (IAU)	*Since 2019*
Euroasian Astronomical Society	*Since 2019*
Armenian Astronomical Society (ArAS)	*Since 2012*

List of Publications

2024

- Guo, Zhen; Lucas, P W; Kurtev, R G; Borissova, J; **Elbakyan, Vardan**; Morris, C; Bayo, A; Smith, L; Caratti o Garatti, A; Contreras Peña, C; Minniti, D; Jose, J; Ashraf, M; Alonso-García, J; Miller, N; Muthu, H D S, "Multiwavelength detection of an ongoing FUOr-type outburst on a low-mass YSO" // 2024, MNRAS, 529, 1
- Nayakshin, Sergei; **Elbakyan, Vardan**, "On the origin of accretion bursts in FUORs" // 2024, MNRAS, 528, 2

2023

- Wu, Yinhao; Chen, Yi-Xian; Jiang, Haochang; Dong, Ruobing; Macías, Enrique; Lin, Min-Kai; Rosotti, Giovanni P.; **Elbakyan, Vardan**, "Distinguishing magnetized disc winds from turbulent viscosity through substructure morphology in planet-forming discs" // 2023, MNRAS, 523, 2
- Nayakshin, Sergei; Owen, James E.; **Elbakyan, Vardan**, "*Extreme evaporation of planets in hot thermally unstable protoplanetary discs: the case of FU Ori*" // 2023, MNRAS, 523, 1
- Vorobyov, Eduard I.; McKevitt, James; Kulikov, Igor; **Elbakyan, Vardan**, "*Computing the gravitational potential on nested meshes using the convolution method*" // 2023, A&A, 671, 81
- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**; Johansen, Anders; Skliarevskii, Alexandr M., Stoyanovskaya, Olga P., "*Formation of pebbles in (gravito-)viscous protoplanetary disks with various turbulent strengths*" // 2023, A&A, 670, 81
- **Elbakyan, Vardan G.**; Nayakshin, Sergei; Meyer, Dominique M. -A.; Vorobyov, Eduard I., "*Episodic accretion and mergers during growth of massive protostars*" // 2023, MNRAS, 518, 791

2022

- **Elbakyan, Vardan G.**; Nayakshin, Sergei; Meyer, Dominique M. -A.; Vorobyov, Eduard I., "*Episodic accretion and mergers during growth of massive protostars*" // 2022, MNRAS, 518, 791
- Meyer, D. M. -A.; Vorobyov, E. I.; **Elbakyan, V. G.**; Kraus, S.; Liu, S. -Y.; Nayakshin, S.; Sobolev, A. M., "*The burst mode of accretion in massive star formation with stellar inertia*" // 2022, MNRAS, 517, 4795
- **Elbakyan, Vardan**; Wu, Yinhao; Nayakshin, Sergei; Rosotti, Giovanni, "*Gap opening by planets in discs with magnetised winds*" // 2022, MNRAS, 515, 3113
- Nayakshin, Sergei; **Elbakyan, Vardan**; Rosotti, Giovanni, "*ALMA constraints on assembly of core accretion planets*" // 2022, MNRAS, 512, 6038

2021

- Liu, Hauyu Baobab; Tsai, An-Li; Chen, Wen Ping; Liu, Jin Zhong; Zhang, Xuan; Ma, Shuo; **Elbakyan, Vardan**; Green, Joel D.; Hales, Antonio S.; Liu, Sheng-Yuan; Takami, Michihiro; Pérez, Sebastián; Vorobyov, Eduard I.; Yang, Yao-Lun, "*Millimeter-sized Dust Grains Surviving the Water-sublimating Temperature in the Inner 10 au of the FU Ori Disk*" // 2021, ApJ, 923, 270
- **Elbakyan, Vardan G.**; Nayakshin, Sergei; Vorobyov, Eduard I.; Caratti o Garatti, Alessio; Eislöffel, Jochen, "*Accretion bursts in high-mass protostars: A new test bed for models of episodic accretion*" // 2021, A&AL, 651, 3
- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**; Liu, Hauyu Baobab; Takami, Michihiro, "*Distinguishing between different mechanisms of FU-Orionis-type luminosity outbursts*" // 2021, A&A, 647, 44
- Meyer, D. M. -A.; Vorobyov, E. I.; **Elbakyan, V. G.**; Eislöffel, J.; Sobolev, A. M.; Stöhr, M., "*Parameter study for the burst mode of accretion in massive star formation*" // 2021, MNRAS, 500, 4448

2020

- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**; Takami, Michihiro; Liu, Hauyu B., "*Effect of luminosity outbursts on protoplanetary disk dynamics*" // 2020, A&A, 643, 13
- Kulikov, Igor; Vorobyov, Eduard; Chernykh, Igor; **Elbakyan, Vardan**, "*Hydrodynamic modeling of self-gravitating astrophysical objects on tetrahedral meshes*" // 2020, JPhCS, 1640
- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**; Omukai, Kazuyuki; Hosokawa, Takashi; Matsukoba, Ryoki; Guedel, Manuel, "*Accretion bursts in low-metallicity protostellar disks*" // 2020, A&A, 641, 72
- **Elbakyan, Vardan G.**; Johansen, Anders; Lambrechts, Michiel; Akimkin, Vitaly; Vorobyov, Eduard I., "*Gravitoviscous protoplanetary disks with a dust component. III. Evolution of gas, dust, and pebbles*" // 2020, A&A, 637, 5

- Vorobyov, Eduard I.; Skliarevskii, Alexandr M.; **Elbakyan, Vardan G.**; Takami, Michihiro; Liu, Hauyu Baobab; Liu, Sheng-Yuan; Akiyama, Eiji, "*The origin of tail-like structures around protoplanetary disks*" // 2020, A&A, 635, 196
- Rab, C.; **Elbakyan, V.**; Vorobyov, E.; Postel, A.; Güdel, M.; Dionatos, O.; Audard, M.; Kamp, I.; Thi, W. -F.; Woitke, P., "*The chemistry of episodic accretion*" // 2020, Proceedings of the IAU, 350, 440
- **Elbakyan, Vardan G.;** Vorobyov, Eduard I., *"Gravitational fragmentation and formation of giant protoplanets on orbits of tens of AU"* // 2020, Proceedings of the IAU, 345, 234

2019

- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**, *"Gravitoviscous protoplanetary disks with a dust component. II. Spatial distribution and growth of dust in a clumpy disk"* // 2019, A&A, 631, 1
- Molyarova, T. S.; **Elbakyan, V. G.**, *"Chemical impact of FUor outburst in embedded objects"* // 2019, INASAN Science Reports, 4, 45
- Vorobyov, Eduard I.; Skliarevskii, Aleksandr M.; **Elbakyan, Vardan G.**; Pavlyuchenkov, Yaroslav; Akimkin, Vitaly; Guedel, Manuel, *"Gravitoviscous protoplanetary disks with a dust component. I. The importance of the inner sub-au region"* // 2019, A&A, 627, 154
- **Elbakyan, Vardan G.**; Vorobyov, Eduard I.; Rab, Christian; Meyer, Dominique M.-A.; Güdel, Manuel; Hosokawa, Takashi; Yorke, Harold, "*Episodic excursions of low-mass protostars on the Hertzsprung-Russell diagram*" // 2019, MNRAS, 484, 146
- Meyer, D. M.-A.; Vorobyov, E. I.; **Elbakyan, V. G.**; Stecklum, B.; Eislöffel, J.; Sobolev, A. M., "*Burst occurrence in young massive stellar objects"* // 2019, MNRAS, 482, 5459

2018

- Pavlyuchenkov, Ya. N.; **Elbakyan V. G.**; Vorobyov E. I.; Shustov B. M., "*Gravitationally Bound Fragments in a Protoplanetary Disk as Possible Places of Chondrules Formation*" // 2018, LPICo, 2067, 6037P
- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**, *"Gravitational fragmentation and formation of giant protoplanets on tens-of-au orbits"* // 2018, A&A, 618, 7
- Vorobyov, Eduard I.; **Elbakyan, Vardan G.**; Plunkett, Adele L.; Dunham, Michael M.; Audard, Marc; Guedel, Manuel; Dionatos, Odysseas, *"Knotty protostellar jets as a signature of episodic protostellar accretion?"* // 2018, A&A, 613, 18

2017

- Vorobyov, Eduard I.; Steinrueck, Maria; **Elbakyan, Vardan**; Guedel, Manuel, *"Formation of freely floating sub-stellar objects via close encounters"* // 2017, A&A, 608, 107
- Vorobyov, Eduard; **Elbakyan, Vardan**; Hosokawa, Takashi; Sakurai, Yuya; Guedel, Manuel; Yorke, Harold, *"The effect of accretion on the pre-main-sequence evolution of low-mass stars and brown dwarfs"* // 2017, A&A, 605, 77
- Rab, Ch., **Elbakyan, V.**, Vorobyov, E., Güdel, M., Dionatos, O., Audard, M., Kamp, I., Thi, W.-F., Woitke, P., Postel, *"The chemistry of episodic accretion in embedded objects. 2D radiation thermo-chemical models of the post-burst phase"* // 2017, A&A, 604, 15
- Eduard I. Vorobyov, **Vardan Elbakyan**, Michael M. Dunham, Manuel Güedel, *"On the nature of very low luminosity objects (VeLLOs)"* // 2017, A&A, 600, 36
- I. Baraffe, **V. G. Elbakyan**, E. I. Vorobyov, G. Chabrier, *"Self-consistent evolution of accreting low-mass stars and brown dwarfs"* // 2017, A&A, 597, 19
- Vorobyov, E. I.; **Elbakyan, V.;** Hosokawa, T.; Sakurai, Y.; Guedel, M.; Yorke, H., *"Pre-main-sequence evolution of low-mass stars and brown dwarfs with accretion"* // 2017, MmSAI, 88, 627

2016

- **Elbakyan V.G.**, Vorobyov E.I., Glebova G.M., "*Variations in the accretion rate and luminosity in gravitationally unstable protostellar disks"* // 2016, Astronomy Reports, 60, 879