

Hripsime Mkrtchyan

Assistant professor at Akian College of Science and Engineering, American University of Armenia
E-mail: hmkrtchyan@aua.am
Mobile: +37455193536

Education

15/01/2014- 23/09/2019	Ph.D. in Physics Cosmic Ray Division, A. Alikhanian National Science Laboratory (Yerevan Physics Institute) Ph.D. Thesis: “Behaviour of electric field during fair weather and thunderstorms” Supervisor: Prof. Ashot Chilingarian
01/09/2011 – 22/05/2013	Master of Science degree in Physics, Department of Nuclear Physics, Yerevan State University, Armenia. Diploma with honours
01/09/2007 – 26/05/2011	Bachelor in Applied Physics , Physics Faculty, Yerevan State University, Diploma with honours

Professional experience

2022- till now	Assistant professor at Akian College of Science and Engineering, American University of Armenia
2011 - 2022	Researcher, A. Alikhanyan National Science Laboratory
2021 - 2022	Civil and Environmental Engineering department Massachusetts Institute of Technology, Fulbright Postdoc Fellow: studying radiation coming from thundercloud and its electric structure based on remote sensing.
01/08/2019 - 30/10/2019	Acopian Center for the Environment, American University of Armenia, researcher: investigating environmental issues caused by unsettled waste management and listing infrastructures which exist in Armenia
18/01/2016 – 16/02/2017	Technology and Science Dynamics (TSD) LLC, Head of Physics Department: leading group of physicists working on scientific start-ups, presenting start-ups during international competitions and meetings.
01/06/2010 - 01/07/2017	“Assessment and Testing Center”, collaborator: watcher admission exams, based on contract.
01/06/2009 - 01/09/2009	“Luysi Astgh” Foundation, computer teacher.

Supervising, mentoring activities

2018 –2021	Supervision of three Bachelor and one Master degree students. Department of Nuclear Physics, Faculty of Physics, Yerevan State University, Armenia.
05/2019 – 11/2019	Mentor for Bachelor student in participation in Eastern Partnership Civil Society Facility for developing the culture of waste Management in Armenian communities.

Scholarships

2014-2015	Scholarship from World Federation of Scientists
2014	Scholarship from ACCES (French Ministry of Research and High Education) for participating in European Research Course on Atmosphere (ERCA) 2015
2012-2013	Scholarship named by Kirakos Vaporchian
2009-2010	Scholarship from “Barepasht Serund”
2007-2013	Government scholarship for study with honor

Fellowships and travel grants

02/2021 – 09/2021	Fulbright Fellowship, MIT, Cambridge, MA, USA
12/2020 – 12/2021	Faculty Research grant, EIF, PMI
2020	Armenian National Science and Education Fund Award
2019	Travel grant from Gulbenkian Foundation
2018	Travel grant from IUPAP, Women in Physics
2018	Student Travel Grants, AGU
2018	STSM, COST action 15211, Bath, UK
2017	Travel grant from Gulbenkian Foundation
2014	Travel grant from International Centre for Theoretical Physics (ICTP)

Administrative representations

2021 - present	Leadership Committee member of Atmospheric and Space electricity section of AGU
2020 - present	Historical Sites Selection Committee member of European Physical Society
2020 - present	Action Committee member of European Physical Society Young Minds project
2018 - present	Board member of "Young Scientist's Support Program" of Armenia
2017 - 2018	President of European Physical Society Young Minds Armenian Section
2016 - 2020	NCP for Secure Societies and Space of Armenia in EU Horizon 2020
2011 - 2012	Secretary of YSU and NAS SPIE Student Chapter

I also have experience as a reviewer for the "Journal of Atmospheric and Solar-Terrestrial Physics", "Atmosphere, MDPI", "Journal of Geophysical Research" and "Atmospheric Research" journals.

Scientific events attended for last 5 years and presented talks/posters

- 7th IUPAP International Conference on Women in Physics, 11-16 July 2021, National representative, virtual Meeting.
- *The Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) Workshop*, 20 - 25 June, 2021, Virtual Meeting
- 10th Leadership meeting of *European Physical Society Young Minds Programme*, May 7, 2021, virtual meeting.
- *Thunderstorm & Elementary Particle Acceleration (TEPA) annual meeting*, 2013-2019, Nor Amberd, Armenia
- *P4P conference*, October 3-5, 2019, Skopje, Northern Macedonia
- *COST Action CA15211 annual meeting*, September 23-25, 2019, Sopron, Hungary
- *8th Leadership meeting of European Physical Society Young Minds projects*, May 24-25, 2019, Erlangen, Germany
- *American Geophysical Union (AGU) Annual Fall Meeting*,
 - December 10-14, 2018, Washington D.C., USA
 - December 09-13, 2019, San Francisco, USA
- *COST Action CA15211 annual meeting*, September 26-28, 2018, Limassol, Cyprus
- *7th Leadership meeting of European Physical Society Young Minds projects*, May 3-5, 2018, Prague, Czech Republic
- *STSM within COST action*, April 15-23, 2018, Bath, UK
- *GLOCAEM collaboration meeting*, March 20-22, 2018, Bath, UK
- *The Batsheva de Rothschild Seminar on the Atmospheric Global Electric Circuit (GEC)*, February 5-10, 2017, Mitzpe Ramon, Israel
- *European Geosciences Union (EGU) annual meeting*, April 23-28, 2016, Vienna, Austria
- *European Research Course on Atmospheres (ERCA)*, January 7- February 6, 2015, Grenoble, France

Recent Scientific talks

During my research career so far, I have presented over 17 oral talks and 11 poster presentations at international scientific conferences and meetings. Details of the most recent oral presentations are given below:

Argonne National Laboratory, September 15, 2021, virtual invited talk,

- *Thundercloud Configurations Favourable for Radiation Enhancement in Surface Detectors at Aragats.*

Enterprise Incubator Foundation, April 16, 2021, virtual talk

- Thunderstorm activity over Aragats

AGU Fall meeting, December, 2019, San Francisco, USA

- *Electric Field Polarity Asymmetry in the Occurrence of Thunderstorm Ground Enhancements during the End of Storm Oscillation (EOSO)*
- *Invited talk - U34A - When You Wish Upon a Star: ECS Perspectives on the Future of Beyond Earth Sciences.*

TEPA, October 2019, Armenia

- *Radar Diagnosis of the Thundercloud Electron Accelerator*

P4P conference, October, 2019, Skopje, Macedonia

- *Behavior of the electric field during thunderstorms at different altitudes*

Conference organization

2022	Member of Org. Com. as AC member of YM EPS, EPS forum, Sorbonne University, Paris, France, 2-4 June, 2022.
2021	Member of Org. Com. as AC member of YM EPS, EPS, 10 th leadership meeting
2021	Member of Org. Com. “Armenians Forward Together” forum, 12-14 August, hybrid, Yerevan, Armenia
2018	Volunteer at 50th anniversary celebrations of the European Physical Society in Geneva.
2018	Member of Local Org. Com. of International Symposium on Optics & its applications (OPTICS-2019), Yerevan, Armenia
2013 - 2015	Coordinator of TEPA, Nor Amberd, Armenia
2012	Manager of International Advanced School on Frontiers in Optics & Photonics (FOP-2012), Yerevan, Armenia
2011	Member of Local Org. Com. of International Symposium on Optics & its applications (OPTICS-2011), Yerevan, Armenia
2009	Coordinator of 3th BAO summer school for YSU students, Byurakan, Armenia

Public Outreach

As part of my outreach and public engagement experience, I have founded, and managed a number of groups for young people, and the wider public:

2021 – present	Co-founder of Association of Physics Alumni and friends (the goal is to develop physics-based project to improve quality of educational system in university)
2021- present	Co-founder of Awesome Nature Armenia Foundation (the goal is to solve environmental issues in Armenia)
2020-present	Science on Camera Video contest for students and school kids.
2018 - present	Co-founder of “EcoWaste” NGO (the goal is to fight against environmental issues)
2018 - present	Mentoring scientific projects: “Handmade Science”, “Whispering dishes” scientific monument, “Escape science room” video game.
2018 - present	Founder of “Aghb che / It’s not Trash activities” (the goal is to show that recycling is possible in Armenia)
2017 - present	Founder of European Physical Society Yerevan Young Minds Section (Armenia)
2017 - present	Organizer of scientific outreach activities at schools in Armenia (the goal is to speak and to show the beauty of science, and increase interest for it)

Outreach Projects and Competitions

Start-up project: Simple Liquid Batteries

- Winner of ClimateLaunchPad National final, September 9, 2016, Yerevan, Armenia
- Finalist of ClimateLaunchPad European final, October 8, 2016, Tallinn, Estonia
- Finalist of CleanTech National final, November 29, 2016, Yerevan, Armenia

Outreach Awards

Development of the outreach activities which I have led have also resulted in several awards:

2019	Best activity award 2019, European Physical Society
2019	Best Eco Project 2019, Armenia Tourism Award
2018	“Handmade Science”, Awesome Foundation award

International Collaborations

- Member of the Management Committee of the EU COST action CA15211 – ELECTRONET(2017-2020)
- Member of The Global Coordination of Atmospheric Electricity Measurements (GloCAEM) network (2016-2018)

Professional Memberships

2018 – present	American Geophysical Union (AGU) membership
2018 – present	Member of Earth Science Women's Network (ESWN)
2017 – present	European Physical Society (EPS) membership
2010 – 2018	SPIE (International Society for Optics & Photonics) membership
2009 – 2012	Member of YSU Student Council

Language Skills

Armenian (native)
Russian (good)
English (good)
French (beginner)

Publications

1. Williams E., Mkrtchyan H., et al. RADAR Diagnosis of the Thundercloud Ground Enhancements. Journal of Geophysical Research Atmospheres. JGR, 2022
2. **Mkrtchyan H.** et al. Atmospheric electric field variations during fair weather and thunderstorms at different altitudes. *Journal of Atmospheric and Solar-Terrestrial Physics*. Volume 211, 2020
SS: This publication discusses thunderstorm activity over the western-north part of Armenia based on electric field records. It presents also fair-weather electric field disturbances at different location in Armenia which has been investigated first time.
3. Fdez-Arroyabe P. et al (incl. **Mkrtchyan H.**) Glossary on atmospheric electric field and its biological effects. *Int J Biometeorol* 65, 5–29, 2021.
SS: The paper collects and presents glossary of terms which describe atmosphere related phenomena in one place.
4. Chilingarian A., Hovsepyan G., Karapetyan T., Karapetyan G., Kozliner L., **Mkrtchyan H.**, et al. Structure of thunderstorm ground enhancements. *Phys. Rev. D* 101, 122004, 22 June 2020
SS: This paper discusses thunderstorms accompanied by long lasting TGEs and reveal the presence of gamma rays/electrons with energies above 3 MeV in the energy spectra of detected particles.
5. Nicoll K., et al. (incl. **Mkrtchyan H.**) A global atmospheric electricity monitoring network for climate and geophysical research. *Journal of Atmospheric and Solar-Terrestrial Physics* Volume 184, March 2019, Pages 18-29, 2019
SS: The publication presents fair weather electric field measurements over 17 stations around the world.

6. Chilingarian A., **Mkrtchyan H.** et al. Catalog of 2017 Thunderstorm Ground Enhancement (TGE) events observed on Aragats. Scientific Reports, Vol. 9, Article number: 6253, 2019
SS: This paper presents catalog of TGEs registered in 2017. It discusses different characteristics of cases.
7. **Mkrtchyan H.**, Study of Atmospheric Discharges by Near Surface Electric Field Measurements. The Open Atmospheric Science Journal, Vol. 12, Pages 21-32, 2018
SS: The mono article discusses electrical discharges and disturbances of electric field during discharges. It shows that recovery curve after lightning are not only exponential but also has power and linear shape.
8. Yaniv R., Yair Y., Price C., **Mkrtchyan H.**, Lynn B., Reymers A., Ground-based measurements of the vertical E-field in mountainous regions and the “Austausch” effect. Atmospheric Research, Vol. 189, Pages 127-133, 2017
SS: This publication presents fair weather electric field diurnal variations over mountain region in Israel and in Armenia. It explains influence of local effects on near surface electric field.
9. Chilingarian A., **Mkrtchyan H.**, Lower positive charge region (LPCR) and its influence on initiation of Thunderstorm ground enhancements (TGEs) and cloud-to-ground (CG-) and intracloud (IC-) lightning occurrences. Journal of Physics: Conference Series, Vol. 409 012219, 2013.
SS: The publication discusses cloud tripole structure and distribution of lightning types during TGEs for the first time.
10. Chilingarian A., **Mkrtchyan H.** Role of the Lower Positive Charge Region (LPCR) in the initiation of the Thunderstorm Ground Enhancements (TGEs). Physical Review D86, 072003, 2012.
SS: The paper classifies thunderstorms over mt. Aragats based on electric field patterns and reveals the importance of LPCR for TGEs origination for the first time.

Publications in progress

1. Williams E. **Mkrtchyan H.**, Chilingarian A., Hovepyan G., Why Schonland Failed in his Search for Runaway Electrons from Thunderstorms. *Will be submitted on December*
2. **Mkrtchyan H.** et al. Lightning Climatology over Armenia. *Under Preparation*
3. **Mkrtchyan et al.** Radar observation of debris clouds making TGEs with strong negative charge overhead. *Under Preparation*

Science related articles

1. Zeltner R., **Mkrtchyan H.** et al The Young Minds Leadership Meeting 2021 a virtual experience. Europhysics News Vol 52, N. 4, (2021)
2. Martin C. et al. (incl. **Mkrtchyan H.**) Strengthening the sense of belonging in a time of distancing. Europhysics News Vol 52, N. 1, Page 10 (2021)
3. Mattia Ostinato et al. (incl. **Mkrtchyan H.**) Social Engagement, Connections and Growth: How Young Minds shapes the physicists of the future. Europhysics News Vol 51, N. 5, Page 16 (2020)
4. **Mkrtchyan H.** and Davit Aslanyan, How Yerevan Young Minds Faces Challenges in 2020, EPS News (2020)