

Keren Mezuman

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RESEARCH INTERESTS

Data science; air quality and climate interactions; biomass burning prediction; fire risk; fire weather; land use land cover changes; agriculture climate impacts; air pollution health impacts; global scale modeling

EDUCATION

Ph.D. , Columbia University, Earth and Environmental Sciences, Climate Modeling	Expected 2018
M.Phil. , Columbia University, Earth and Environmental Sciences, Climate Modeling	2016
M.Sc. , (Summa Cum Laude), Tel Aviv University, Geophysics	2013
B.Sc. , Tel Aviv University, Geophysics	2011

HONORS AND AWARDS

IGAC Early Career Travel Grant	2016
AGU Fall Meeting Student Travel Grant	2015
Top 2014 NASA GISS Publication 4 th place	2014
Dean's Fellow, Columbia University, Department of Earth and Environmental Sciences	2013
DACA-13 Student Travel Grant	2013
Excellence Scholarship, Tel Aviv University, Department of Geophysics	2012
Excellence Grant for New Undergraduates, Tel Aviv University	2008

RESEARCH EXPERIENCE

Graduate Researcher, NASA Goddard Institute for Space Studies, New York, NY 2013-Present

- Model global fire activity, burnt area, and emissions by applying multivariate analysis to MODIS data
- Implemented the model in the NASA GISS Earth Systems Model (ModelE) Fortran code
- Analyzed variability of airborne particles using observational sampling of 14 flight campaigns, identified biases in different physical modules of the GCM
- Co-developed a big data tool that analyzes surface observations regardless of source, size, or format, aimed at deriving insights on global air pollution

Graduate Researcher, Department of Geophysics, Tel Aviv University, Israel 2011-2013

- Developed a clustering model based on computer vision that detects global thunderstorm clusters
- Conducted spatial analysis of lightning strokes from the World Wide Lightning Location Network (WWLLN) using EOF, PCA and Fourier Transform for viability studies

Research Assistant, Department of Natural Sciences, The Open University of Israel 2009-2013

- ILAN Team Leader: a research group devoted to the study of Transient Luminous Events
- Trained and mentored 5 subordinate research assistants to perform Time Series Analysis in Matlab
- Organized and coordinated field campaigns in Israel and in Europe ([Eurosprite](#))

TECHNICAL SKILLS: Bash, Fortran, IDL, Matlab, Python, SQL, Git, Unix/Linux

PUBLICATIONS

In prep.	Mezuman K. , S. E. Bauer, and K. Tsigaridis: PyrE, an interactive fire module within the NASA-GISS Earth System Model
	Mezuman K. , S. E. Bauer, and K. Tsigaridis: Fire pollution and health impacts for preindustrial, present day and future (2100) in an interactive Earth System Model
	S. E. Bauer, U. Im, K. Mezuman : Agricultural fires, desert dust and industrialization: Health impacts of air pollution in Africa

- M. Petrenko, R. Kahn,..., **K. Mezuman**,...: Regional Biomass Burning Emissions-Inventory Analysis Based on Satellite-Constrained AeroCom Models
- 2016 **Mezuman, K.**, S. E. Bauer, and K. Tsigaridis, Evaluating secondary inorganic aerosols in three dimensions. *Atmos. Chem. Phys.*, **16**, 10651-10669, doi:10.5194/acp-16-10651-2016
- 2014 **Mezuman, K.**, C. Price, and E. Galanti, On the spatial and temporal distribution of global thunderstorm cells. *Environ. Res. Lett.*, **9**, no. 12, 124023, doi:10.1088/1748-9326/9/12/124023
- 2013 Yair, Y., L. Rubanenko, **K. Mezuman**, G. Elhalel, M. Pariente, M. Glickman-Pariente, B. Ziv, Y. Takahashi, and T. Inoue, New color images of transient luminous events from dedicated observations on the International Space Station. *J. Atmos. Sol.-Terr. Phys.*, **102**, 140-147, doi:10.1016/j.jastp.2013.05.004

CONFERENCE PRESENTATIONS AND INVITED SEMINARS

- K. Mezuman**, “PyrE: a data-driven fire parameterization for global climate models”
SRON Netherlands Institute for Space Research Seminar Series, Utrecht, NL APR 2018
- K. Mezuman**, S. E. Bauer, and K. Tsigaridis, “PyrE, an Interactive fire module within the NASA-GISS Earth System Model”
Fire: Modeling and Prediction Issues (part 1), NOAA MAPP Webinar APR 2018
Conference on Fire Prediction Across Scales, New York, NY OCT 2017
AGU Fall Meeting 2017, New Orleans, LA DEC 2017
- K. Mezuman**, S. E. Bauer, and K. Tsigaridis, “Fire pollution for preindustrial, present day and future (2100) in an interactive Earth System Model”
Fifth iLEAPS Science Conference, Oxford, UK SEP 2017
EGU General Assembly 2017, Vienna, AT APR 2017
AGU Fall Meeting 2016, San Francisco, CA DEC 2016
NASA GISS Seminar Series, New York, NY DEC 2016
- K. Mezuman**, S. E. Bauer, and K. Tsigaridis, “Evaluating Ammonium, Nitrate, and Sulfate Aerosols in 3-Dimensions”
IGAC Project 2016 Science Conference, Breckenridge, CO SEP 2016
10th Yoram Kaufman Memorial Symposium, NASA Goddard JUN 2016
Space Flight Center, Greenbelt, MD
NASA GISS Seminar Series, New York, NY JAN 2016
AGU Fall Meeting 2015, San Francisco, CA DEC 2015
International Aerosol Modeling Algorithms (IAMA) 2015, Davis, CA
- K. Mezuman**, C. Price, E. Galanti, “The diurnal cycle of global thunderstorm clusters”
International Conference on Atmospheric Electricity (ICAE), Norman, OK JUN 2014
AGU Fall Meeting 2013, San-Francisco, CA DEC 2013
- K. Mezuman**, C. Price, and E. Galanti, “The number of active global thunderstorms”
Davos Atmosphere and Cryosphere Assembly (DACA-13), Davos, CH JUL 2013
EGU General Assembly 2013, Vienna, AT APR 2013
- K. Mezuman**, E. Galant, C. Price, “How many thunderstorms are active at any moment?”
The Israel Meteorological Society Meeting (IMS), Tel-Aviv, IL MAR 2011
- S. E. Bauer, **K. Mezuman**, K. Longo, A. da Silva, “Origin, extend and health impacts of

air pollution in Sub-Saharan Africa”

EGU General Assembly 2017, Vienna, AT

APR 2017

AGU Fall Meeting 2017, New Orleans, LA

DEC 2017

Y. Yair, C. Price, **K. Mezuman**, L. Rubanenko, D. Katzenelson, N. Rosenthal, “Sprite climatology in the eastern Mediterranean region”

International Conference on Atmospheric Electricity (ICAE), Norman, OK

JUN 2014

Y. Yair, L. Rubanenko, D. Katzenelson, N. Rosenthal, **K. Mezuman**, C. Price, “The ILAN sprite campaign in Israel: Results from 7 years of observations”

EGU General Assembly 2014, Vienna, AT

APR 2014

Y. Yair, L. Rubanenko, **K. Mezuman**, G. Elhalel, M. Priente, M. Glickman-Pariente, B. Ziv, Y. Takahashi, and T. Inoue, “New color images of sprites, halos and gigantic jets from the International Space Station”

AGU Fall Meeting 2012, San-Francisco, CA

DEC 2012

Y. Yair, **K. Mezuman**, B. Ziv, M. Priente, M. Glickman, Y. Takahashi, and T. Inoue, “Predicting global thunderstorm activity for sprite observations from the International Space Station”

EGU General Assembly 2012, Vienna, AT

APR 2012

E. Arnone, J. Bor, O. A. Chanrion, R. Labanti, **K. Mezuman**, T. Neubert, A. Odzimek, S. Soula, O. van der Velde, Y. Yair, and Eurosprite, “On the distribution and seasonal cycle of transient luminous events above Europe”

EGU General Assembly 2012, Vienna, AT

APR 2012

Y. Yair, M. Ben-Yona, N. Reicher, **K. Mezuman**, A. Lousky, C. Price, and J. B’or, “Optical observations of a possible connection between meteors and sprites during the 2009 Geminid shower”

International Conference on Atmospheric Electricity (ICAE), Rio de Janeiro, BR

AUG 2011

C. Price, **K. Mezuman**, E. Galanti, “Are There Really 2000 Thunderstorms Active at any Time?”

International Union of Geodesy and Geophysics Meeting, Melbourne, AU

JUN 2011

C. Price, **K. Mezuman**, E. Galanti, “How many thunderstorms are active at any moment?”

EGU General Assembly 2011, Vienna, AT

APR 2011

Y. Yair, M. Ben-Yona, N. Reicher, **K. Mezuman**, A. Lousky, and C. Price, “The spatial and temporal relations between sprites and meteors during the 2009 Geminid shower”

EGU General Assembly 2011, Vienna, AT

APR 2011

Y. Yair, M. Ben-Yona, N. Reicher, **K. Mezuman**, and C. Price, “Optical observations of the spatial and temporal relations between sprites and meteors during the 2009 Geminid shower”

AGU Fall Meeting 2010, San-Francisco, CA

DEC 2010

TRAINING AND WORKSHOPS

iLEAPS Early Career Workshop, Oxford, United Kingdom

2017

IGAC Early Career Short Course, Boulder and Breckenridge, Colorado

2016

Network on Chemistry Climate Interactions in the Regional and Global Scales,

Aarhurs University, Roskilde, Denmark

Southeast Atmosphere Studies Modeling Workshop, Princeton, New Jersey 2015

ACCENT-PLUS, Drivers, feedbacks and impacts in air quality and climate change, Urbino, Italy 2014

TOSCA Training School, Impact of Solar Variability on Climate, Thessaloniki, Greece 2013

The Amos de-Shalit Ulpana for Chemistry, Geochemistry and Environmental Sciences, Weizmann Institute of Science, Israel 2010

TEACHING EXPERIENCE

Teaching Assistant, Columbia University, Department of Earth and Environmental Sciences

“Intro. to Atmospheric Chemistry” (EESC4924), Prof. Arlene Fiore Spring 2016

“Earth’s Environment System: Climate” (EESC2100), Prof. Adam Sobel, Prof. Tiffany Shaw, Prof. Jerry McManus, and Prof. Sonya Dyhrman Fall 2014, 2015

Teaching Assistant, Tel Aviv University, Department of Geophysics

“Physics of the Atmosphere” (0341-2005), Prof. Colin Price, and Prof. Peter Israelevitch Fall 2011, 2012

“Laboratory for Earth and Space Sciences” (0341-3247), Prof. Nili Harnik Fall 2011, 2012

SERVICE AND OUTREACH

Representative, Columbia University’s Graduate Student Advisory Council 2017-2018

Organizer, NASA GISS Lunch Seminar Series 2017-2018

Contributor, lbscience.org, The Israeli Science Blog (100,000 followers on Facebook)

Administrator, Columbia Earth and Environmental Sciences [Linkedin Alumni Group](#)

Volunteer, World Science Festival Fair, New York University JUN 2017

Volunteer, Sun and Earth Day, American Museum of Natural History MAR 2017

Co-P.I., The Stroke Memorial Fund (\$13,275), Graduate Student Field Trip MAR 2017

Co-P.I., The Chevron Student Initiative Fund (\$3,000), Lamont-Doherty Weather and Air Quality [Station](#) NOV 2013

LANGUAGES

English (fluent); Hebrew (native); French (proficient)

Citizenships: Israeli, German