EHSAN GHARIB-NEZHAD

CURRICULUM VITAE

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EMPLOYMENT

Postdoctoral Research Fellow, NASA Ames Research Center (Advisor: Dr. Mark S. Marley). 1/2020–1/2022
Research Scientist, Bay Area Environmental Research Institute. 09/2019–1/2020

EDUCATION

PhD, Exoplanetary Atmospheric Modeling / Spectroscopy, Arizona State University, USA. 6/2019
Co-Advisers: Drs. Micheal R. Line and James R. Lyons

M.Sc. Physical Chemistry / Spectroscopy, University of Tehran, Iran. 9/2013
Advisor: Dr. Alireza Shayesteh

AWARDED GRANT PROPOSALS

Cycle 28 HST, Co-I 2020-2022
Title: Cycle 28 Program AR-16139 A Grid Idea: A New Comprehensive Self-Consistent Radiative-Convective Model Grid for Exoplanet Atmospheres.
Cycle 27 HST, PI 2019-2021
Title: Composition Dependent Molecular Opacity Database for High-Metallicity Exoplanet Atmospheres.
Graduate Research Support Program, PI 2016-2017
Graduate and Professional Student Association, ASU.
JumpStart Grant, PI 2016-2017
Graduate and Professional Student Association, ASU.

SELECTED PUBLICATIONS

E. Gharib-Nezhad, M. Marley, C. Vissher, and N. Batalha "The chemistry of Li-bearing Molecules in Brown-dwarf Atmospheres" In Prep.

E. Gharib-Nezhad, A. Iyer, M. Line, R. Freedman, M. Marley, and N. Batalha "EXOPLINES: Molecular Opacities for Brown-Dwarf and Giant Exoplanet Atmospheres" In Revision

E. Gharib-Nezhad, A.N. Heays, H.A. Bectel, and J.R. Lyons "H_2-Induced Pressure Broadening and Pressure Shift in the P-Branch of the ν_3 Band of CH4 from 300 to 655 K", JQSRT, 239, 106649. 2019

E. Gharib-Nezhad, M. R. Line "The Influence of H_2O Pressure Broadening in High-Metallicity Exoplanet Atmospheres", ApJ, 872, 27. 2019

J. Fortney, T.D. Robinson, S. Domagal-Goldman et al. "The Need for Laboratory Measurements and Ab Initio Studies to Aid Understanding of Exoplanetary Atmospheres.", arXiv:1905.07064. 2019

J. R. Lyons, **E. Gharib-Nezhad** & T.R. Ayres, "Carbon isotope composition of the solar photosphere", Nature Communication 9, 908. 2018

A. Shayesteh, S. F. Alavi, M. Rahman, **E. Gharib-Nezhad** "Ab initio transition dipole moments and potential energy curves for the low-lying electronic states of CaH", Chem. Phys. Lett., 667 , 345. 2017

E. GharibNezhad, A. Shayesteh & P. F. Bernath, "Einstein A coefficients for rovibronic lines of the A $^2\Pi \rightarrow X^2\Sigma^+$ and $B'^2\Sigma^+ \rightarrow X^2\Sigma^+$ transitions of MgH", MNRAS, 432, 2043. 2013

E. GharibNezhad, A. Shayesteh & P. F. Bernath, "Fourier transform emission spectra of the A $^2\Pi \rightarrow X^2\Sigma^+$ and $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transitions of CaD" J. Molec. Spec., 281, 47. 2012

RESEARCH EXPERIENCE

Generating Opacities for molecules such as water, metal hydrides/oxides with EXOMOL-group Fortran code as well as HITRAN-group python code.

Modelling Exoplanet/Brown-dwarf Atmospheres using 1D radiative-convective transfer *CHIMERA* code and *PICASO* code.

Analysing Molecular Spectra of diatomic and polyatomic molecules using *Pgopher*, *Level* Fortran Code, Soleil fitting Code.

Measuring Optical Constants and Recording Molecular Spectra using FTIR Spectroscopy, Spectroscopic Ellipsometry, Electric Plasma Discharge, UV-Vis spectroscopy.

TECHNICAL SKILLS

Atmospheric Modeling: CHIMERA code (Radiative Transfer), Python, Fortran (basic)
Spectral Analysis: Pgopher, Level Code, Soleil fitting Code, Gaussian03, Gaussview
Laboratory Skills: FTIR Spectroscopy, Spectroscopic Ellipsometry, Electric Plasma Discharge, UV-Vis spectroscopy, Rutherford backscattering Spectroscopy (basic)

ACADEMIC SERVICES

Reviewer for FINESST 2020	2020
Referee/Reviewer for Icarus Journal	Since 2018
Chair assistant at International Symposium on Molecular Spectroscopy	2018
GPSA Research Grant Reviewer, ASU	2016 – 2018
GPSA Travel Grant Reviewer, ASU	2016 – 2018
Volunteer Homecoming events, School of Molecular Sciences, ASU.	2017, 2018
Volunteer Earth and Space Exploration Day ASU	2015, 2018

SELECTED TALKS

"H_2-induced pressure broadening and pressure shift in the P-branch of the ν_3 band of CH4 from 300 to 655 K", Int. Symp. Molec. Spec., IL. 2019

"Opacity Data: The Need for Laboratory Measurements to Interpret Observational data", Bay Area Exoplanets Meeting 2019

"The influence of pressure broadening on Exoplanet Spectra" Other Worlds Laboratory (OWL), CA. 2018

"H_2 broadening in the ν_3 and ν_4 bands of CH_4 at room temperature", Int. Symp. Molec. Spec., IL. 2018

"The Influence of Pressure Broadening on Exoplanet Atmosphere Spectra" NASA Ames, CA. 2018

"Simulating exoplanet hazes with high temperature discharge experiments", APS, AZ. 2016

CONFERENCE ABSTRACTS

E. Gharib-Nezhad, M.R. Line & J. R. Lyons, "Effect of Pressure Broadening on Emission and Transmission Spectra of H2O Modeled for sub-Neptune/super-Earth exoplanets: An Application to JWST" DPS49, Abstract id:149.19. 2017

J. R. Lyons, **E. Gharib-Nezhad** & T. R. Ayres, "The Carbon Isotope Composition of the Sun", 48th LPSC, id.2309. 2017

E. Gharib-Nezhad, J. R. Lyons & D. P. Wright, "Laboratory Simulation of Haze/Aerosol formation in warm and hot Jupiters" DPS48/EPSC11, Abstract id:122.05. 2017

E. GharibNezhad, J. R. Lyons & D. P. Wright "Simulating Haze Particles in a H2-Rich Exoplanet Atmosphere with High Temperature Discharge Experiments", LPS, Abstract# 2565. 2016

TEACHING EXPERIENCE

Physical Chemistry (CHM341, CHM 348), ASU	2014, 2017
General Chemistry Lab (CHM113, CHM114), ASU	2016 – 2017
Quantum Chemistry/Molecular Spectroscopy, University of Tehran	2012

PROFESSIONAL DEVELOPMENT

Summer School The Other Worlds Laboratory (OWL), UCSC, CA. 2018
Workshop Swagelok Essentials Day of Training, Swagelok Southwest company, Phoenix, AZ. 2017
Winter School NExSS, Biosphere 2 in Oracle, AZ. 2016
Workshop Modern Vacuum Technology, LeRoy Solid state center, ASU, AZ. 2015

REFRENCES

Prof. Mark S. Marley (Postdoc Advisor), NASA Ames Research Center, mark.s.marley@nasa.gov
Prof. Michael R. Line (PhD Co-Advisor), School of Earth and Space Exploration, ASU, mrline@asu.edu
Prof. James R. Lyons (PhD Co-Advisor), School of Earth and Space Exploration, ASU, jimLyons@asu.edu
Prof. Scott G. Sayres (PhD committee member) School of Molecular Sciences, ASU, ssayres@asu.edu
Dr. Alan N. Heays (PhD Collaborator) School of Earth and Space Exploration, ASU, aheays@asu.edu