Name: Danna Qasim

Code: 691

Home institution: Howard University

Name of task/What do you do for CRESST: Parent Body Processing of Amino Acids from Ice Radiation Experiments

What is your background: I was born in Kuwait City, Kuwait. My mother is of Korean heritage and my father is of mainly Palestinian/Jordanian. We moved around until I was 10, when we finally found our home in Tucson, Arizona. I was that kid that was fascinated by the night sky. Unfortunately, school was tough as I did not fit in, and I am also diagnosed with a language disorder. However, I met an astrochemist in high school, and her support gave me the confidence to pursue astrochemistry.

After receiving my bachelor's in chemistry and minor in astronomy, I enrolled in a PhD program at Emory University to specialize in astrochemistry. After a mere 1 year of enrollment, I was deemed unqualified to continue the graduate program and was immediately dismissed. I essentially did not agree with the way I was evaluated and believed in myself that I could do better. I eventually completed my MSc in chemical sciences with 2 publications, and my PhD in astronomy with 11 publications, including a first-author paper in Nature Astronomy. I received two awards for my dissertation: ACS Astrochemistry Outstanding Dissertation Award 2021 and the International Astronomical Union 2020 PhD Prize in Facilities, Technologies and Data Science.

I have helped multiple extraordinarily determined students get into supportive PhD programs after they left their initial PhD programs. Helping these students has been a humbling privilege and is a big reason why I continue to share my story.

Favorite part of being a CRESST Scientist: Being funded to work at NASA on cosmic ices, while collaborating with world-renowned Solar System researchers.

Selected publications (refereed):

20. **Qasim, D.**, R. L. Hudson, and C. K. Materese. 2022 "Measured Radiation-Induced D/H Exchange Rate Constants in Aliphatics Embedded in Water Ice." *Submitted to ApJ*. → CRESST Research

19. Lamberts, T., G. Fedoseev, M. van Hemert, **D. Qasim**, et al. 2022. "Methane Formation in Cold Regions from Carbon Atoms and Molecular Hydrogen." Accepted to ApJ.

18. He, J., M. Simons, G. Fedoseev, K. Chuang, **D. Qasim**, et al. 2022. "Methoxymethanol formation starting from CO hydrogenation." [10.1051/0004-6361/202142414]

17. Fedoseev, G., **D. Qasim**, K.-J. Chuang, et al. 2022. "Hydrogenation of Accreting C Atoms and CO Molecules." [10.3847/1538-4357/ac3834]

16. Molpeceres, G., J. Kästner, G. Fedoseev, **D. Qasim**, et al. 2021. "Carbon Atom Reactivity with Amorphous Solid Water: H_2O-Catalyzed Formation of H_2CO." [10.1021/acs.jpclett.1c02760]

15. Gerakines, P. A., **D. Qasim**, S. Frail, and R. L. Hudson. 2021. "Radiolytic Destruction of Uracil in Interstellar and Solar System Ices." [10.1089/ast.2021.0053] → CRESST Research

14. Ioppolo, S., G. Fedoseev, K.-J. Chuang, H. M. Cuppen, A. R. Clements, M. Jin, R. T. Garrod, **D. Qasim**, et al. 2020. "A non-energetic mechanism for glycine formation in the interstellar medium." [10.1038/s41550-020-01249-0]

13. **Qasim, D.**, M. J. Witlox, G. Fedoseev, et al. 2020. "A cryogenic ice setup to simulate carbon atom reactions in interstellar ices." [10.1063/5.0003692]

12. **Qasim, D.**, G. Fedoseev, K.-J. Chuang, et al. 2020. "An experimental study of the surface formation of methane in interstellar molecular clouds." [10.1038/s41550-020-1054-y]

11. Chuang, K.-J., G. Fedoseev, **D. Qasim**, et al. 2020. "Formation of complex molecules in translucent clouds." [10.1051/0004-6361/201937302]

10. **Qasim, D.**, G. Fedoseev, K.-J. Chuang, et al. 2019. "Formation of interstellar propanal and 1-propanol ice: a pathway involving solid-state CO hydrogenation." [10.1051/0004-6361/201935217]

9. **Qasim, D.**, T. Lamberts, J. He, et al. 2019. "Extension of the HCOOH and CO_2 solid-state reaction network during the CO freeze-out stage: inclusion of H2CO." [10.1051/0004-6361/201935068]

8. **Qasim, D.**, G. Fedoseev, T. Lamberts, et al. 2019. "Alcohols on the Rocks: Solid-State Formation in a $H_3CC{\equiv}CH$ + OH Cocktail under Dark Cloud Conditions." [10.1021/acsearthspacechem.9b00062]

7. Chuang, K.-J., G. Fedoseev, **D. Qasim**, et al. 2018. "H2 chemistry in interstellar ices: the case of CO ice hydrogenation in UV irradiated CO:H2 ice mixtures." [10.1051/0004-6361/201833439]

6. **Qasim, D.**, K.-J. Chuang, G. Fedoseev, et al. 2018. "Formation of interstellar methanol ice prior to the heavy CO freeze-out stage." [10.1051/0004-6361/201732355]

5. Chuang, K.-J., G. Fedoseev, **D. Qasim**, et al. 2018. "Reactive Desorption of CO Hydrogenation Products under Cold Pre-stellar Core Conditions." [10.3847/1538-4357/aaa24e]

4. **Qasim, D.**, L. Vlasak, A. Pital, et al. 2017. "Adsorption of Water, Methanol, and Formic Acid on Fe_2NiP, a Meteoritic Mineral Analogue." [10.1021/acs.jpcc.7b01312]

3. Fedoseev, G., K.-J. Chuang, S. Ioppolo, **D. Qasim**, et al. 2017. "Formation of Glycerol through Hydrogenation of CO Ice under Prestellar Core Conditions." [10.3847/1538-4357/aa74dc]

2. Chuang, K.-J., G. Fedoseev, **D. Qasim**, et al. 2017. "Production of complex organic molecules:H-atom addition versus UV irradiation." [10.1093/mnras/stx222]

1. La Cruz, N. L., **D. Qasim**, H. Abbott-Lyon, et al. 2016. "The evolution of the surface of the mineral schreibersite in prebiotic chemistry." [10.1039/c6cp00836d]