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August 25, 2019

Dr. Ohad Levy
Chair, Professional Staff promotion Committee
Nuclear Research Centre Negev
POB 9001 Beer Sheva ISRAEL

Re: Advancement of Dr. Tali-Bar Kohany to "A" Research Grade

Dear Dr. Levy:

This letter is written in response to your inquiry of August 12 concerning the possible advancement of Dr. Tali Bar-Kohany to Research Grade "A" which is roughly equivalent to an associate professor position at a major research university. The web site for my biographical information is identified in the letterhead here.

We invited Dr. Bar-Kohany to spend a year as a visiting collaborator here, working on the modelling of methane hydrate burning. The very positive endorsement of Professor Sher and her impressive resume were major factors in my decision. I had not previously met her. She spent a very successful year here beginning from the summer of 2013. Tali and I are published a paper based on her efforts in the journal *Combustion and Flame*. I have stayed in contact with her and been aware of her work since that time. She will always be welcome to visit again, even if only for short periods.

Tali Bar-Kohany has worked very nicely on the development of models of the burning of methane hydrate particles. This phenomenon presents a very challenging, multicomponent three-phase problem with melting of the hydrate ice to form liquid water and methane gas and vaporization of the water. Essentially, the H_2O forms from the melting of the hydrate but the methane sublimates and passes through the liquid as a gas without dissolving to any significant extent. Mixing and oxidation of the methane occurs in the surrounding gas film with a heavy concentration of water vapor. Tali has carefully dissected the problem and reasoned the explanations for certain counterintuitive behaviors. She has identified the importance of the fraction of the water that drains without heating and vaporization, shown the effect of convection by means of methane bubbling through the water, explained the cause of the ignition delay, identified how much methane escapes to the ambience before a diffusion flame is established, and shown the differences between finite kinetic and infinite kinetic assumptions.

This analysis is a substantial modification to existing particle or droplet burning theory. New paradigms are appearing here. To the best of my knowledge, this is the first journal publication on the topic of hydrate particle burning.

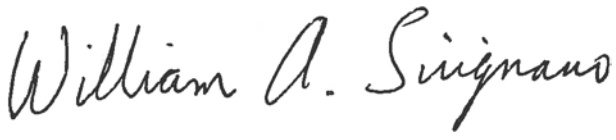
Dr. Bar Kohany's other publications cover an unusually broad range of significant scientific problems in the areas of milt-phase fluid-flows and combustion. There is a paper on flash-boiling atomization with 251 Google-Scholar citations and a paper on IC-engine valve timing with 92 GS citations. Other papers cover effervescent atomization, chemical kinetics, and swirling-flow reactors. Her papers appear in top international journals.

My observation is that Tali Bar-Kohany is a very talented and dedicated researcher. She has a good command of the literature and has good physical reasoning capabilities as well as mathematical skills. With these capabilities, she has provided some useful advice to graduate students working with me. She has also interacted with Professor Dunn-Rankin's experimental team here as well. My perception is that she became a welcome colleague there as well. I have seen her present a seminar at one of Dunn-Rankin's group meetings with myself and an expert on hydrates from our Physics Department as invited attendees. Tali showed very good organizational skills and command of the subject, presenting the material well and answering questions nicely. Allow me to add that she is a very pleasant person to have as a team member. She was always willing to address issues with full energy and honesty and to be helpful to others.

Her strong potential is evaluated with the understanding that she could not publish much of her work in the open literature because it related to national security. Also, she is the mother of three young children and, in the past, that surely required divided attention in earlier years. However, my observation from her year spent here was that she and her husband now have the child care issue well under control.

In summary, Dr. Tali Bar-Kohany has my very strong support for this new research appointment. If more information is needed, please do contact me.

Sincerely yours,



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