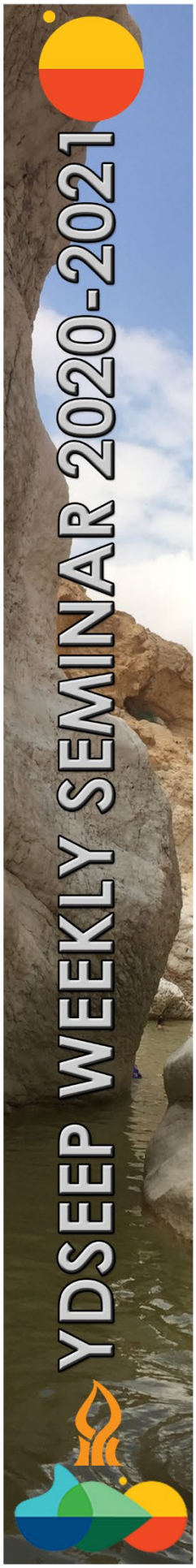

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Ice-binding-proteins and their interaction with ice crystals

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Abstract:

Controlling ice growth is essential in frozen or supercooled systems. We investigate interactions of ice-binding proteins, IBPs, with ice surfaces. We examined the dynamic natu the protein interaction with ice using a variety of methods, including fluorescence micros techniques combined with temperature-controlled microfluidic devices as well as atomic f microscopy. The results show that the binding of IBP to ice is irreversible. The free temperature depression is sensitive to the time allowed for the proteins to accumulate o surfaces. This time sensitivity changes dramatically between different types of IBPs. Our re relate the dynamics and level of activity of various types of IBPs to their ability to bind to spe ice orientations, particularly to the ice's basal plane.

Further, we show that IBP slightly promotes ice nucleation in agreement to their w structuring on one hand that makes them potential nucleators, and the small size on the o hand. Further still, we show that IBPs operate in low temperatures, much lower than evolved to function. And last, we developed a unique AFM stage to investigate ice surfaces IBPs at high resolution, which will be used for further studies on the mechanism of IBP interaction. These results contribute to understanding the mechanisms by which IBPs act will be critical for the successful use of IBP in frozen and supercooled food and cryobiolo applications.

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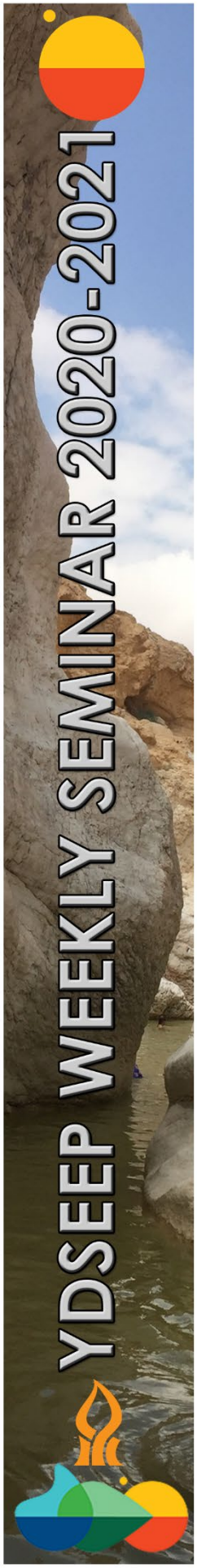
Date & Location:

Tuesday, December 8, 2020

Zoom meeting



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- Supported by the European-Research-Council (ERC) and the Israel-Science-Foundation (ISF)