



**Mr. Yi-Chuan Lu**

Department of Physics

University of California, Berkeley

## Extending the Heat Index to Quantify the Physiological Response to Future Warming

### Abstract

The Heat Index is a widely used measure of apparent temperature that accounts for the effects of humidity using Steadman's model of human thermoregulation. Steadman's model, however, gives unphysical results in sufficiently hot and humid conditions, leading to an undefined Heat Index. In a business-as-usual climate scenario, an undefined Heat Index will become increasingly frequent, eventually occurring across a third of the planet at any given moment. Hence, we extend the Heat Index to all conditions, and map the index onto measurable quantities, including the elevated core temperature in severe conditions and, in fatal conditions, the time it takes for the core to exceed a survivable temperature. The Heat Index is then calculated everywhere on Earth in a business-as-usual climate simulation up to the year 2300, allowing us to assess the habitability of future Earth.

### Zoom Link

<https://fsu.zoom.us/j/92027554191?pwd=dkw2UDRkOE9zQkRhTzR6R05qSUK0Zz09>

**Time:** Thursday, Feb. 11, 2021 @ 3:30 PM  
**Host:** Dr. Zhaohua Wu  
**Note:** Meeting the speaker at 3:00 PM.