

## LCF Seminar Series

### The survival of Arctic summer sea ice in the 21st century



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#### Abstract:

Some scientists and news articles have claimed that the recent decline of Arctic sea ice may soon pass a threshold and the Arctic ocean will become ice free indefinitely. If such a tipping point exists the Arctic Ocean could experience an irreversible bifurcation to a new ice-free state. The large decline in Arctic summer sea ice in the last few years has fueled this notion but cannot provide conclusive evidence that a bifurcation is imminent. 21st century projections with the Community Climate System Model exhibit very rapid sea ice decline in the summer sea ice cover, especially with more pessimistic greenhouse warming scenarios. Summer sea ice anomalies as large as observed in 2007 occur about 1% of the time in the early 21st century simulations. Such large anomalies never occur in pre-industrial simulations, which suggests that thinner sea ice in a greenhouse-warming world will experience larger anomalies with increasing frequency. I will describe a series of simulations that shows the summer sea ice decline in the climate model, while rapid, does not exhibit a bifurcation. I will discuss some of the reasons why climate models project such broad uncertainty in the survival of summer sea ice and which models are likely to be more reliable.

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