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Large earthquakes (magnitude 7 to 9) can take tens of seconds to many minutes to rupture a fault. Whether there is information in the nascent stages of an event to characterize it and forecast its final magnitude is a question that continues to be debated in seismology. This has important implications for operational earthquake early warning systems. Here, each second of delay in issuing an alert grows the radius of the blind zone, where no warning is possible by 3 to 4km. In this talk I will present observations that support a weakly deterministic model of large earthquake rupture. At nucleation it is not yet possible to discern the large form from the very large events. However, soon thereafter rupture organizes into a slip pulse whose characteristics are measurable and diagnostic of an earthquake's final magnitude. Finally I will show how these observations could be used in operational systems.

***Is large earthquake rupture deterministic?
Implications for early warning systems***

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PHYSICS DEPARTMENT

virtual colloquium



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