

**Lundi 15 avril 2019 à 11h30 (IAS, bâtiment 121, salle 1-2-3)**

**Tracking Emerging Active Region Flows and Coronal Activity with SDO**

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The emergence of an active region is a dramatic magnetic event where a great amount of magnetized plasma pierces through the photosphere. Measuring how the photosphere is affected by this emergence has been a technical challenge utilizing the best space instrumentation and data analysis techniques. Since the 1980's the solar physics community has relied on correlation-based techniques to measure the flows from photospheric image series, using granules as tracers of the underlying flow fields that animate the photosphere. I will present the state of the art of flow tracking techniques with SDO data that implements the so-called "Balltracking" paradigm for mapping the photospheric flows at multiple scales. As an application of these new techniques, I will present a first of its kind detection of precursors of photospheric disturbances prior to the emergence of AR 12673. These precursors are seen as a disruption of the moat flow several hours before the onset of strong flux emergence near the main sunspot. The new methods utilized for this study can be fully automated for data mining over the epoch covered by SDO; from the detection and tracking of emerging flux to the characterization moat flows and supergranular flows.

SDO and its petabyte-scale data archive have propelled the community in the realm of big data analytics that require more efficient techniques to keep up with an otherwise overwhelming flow of data. We combine the calibration data of the AIA "cosmic ray spikes" with the mapping of the photospheric flows to determine possible solar sources of what may be mislabeled and of solar origin.