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Non-admissibility of Spiral-like strategies in Bressan's Fire Conjecture

Monday, 12 January 2026 15:00 (1 hour)

In this talk we will introduce Bressan's Fire Conjecture: it is concerned with the model of wild fire spreading in a region of the plane and the possibility to block it using barriers constructed in real time. The fire starts spreading at time $t = 0$ from the unit ball $B_1(0)$ in every direction with speed 1, while the length of the barrier constructed within the time t has to be lower than σt, where σ is a positive constant (construction speed). If $\sigma \leq 1$ Bressan proved that no barrier can block the spreading of the fire, while if $\sigma > 2$ there exists always a strategy that confines the fire. In 2007 Bressan conjectured that if $\sigma \leq 2$ then no barrier can block the fire. In this talk we will prove Bressan's Fire Conjecture in the case barriers are spirals. Moreover, we will give the construction of the optimal spiral, showing that any spiral can block the fire if $\sigma \geq 2.6144..$ (critical speed for spirals).

This is a joint work with Stefano Bianchini.

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