

RECITS Seminar

April 15th, 2026

From 10 a.m. to 11 a.m.

Seminar room, CAM building
Faculty of Mathematics, USTHB.

Speaker: Abdelghani MEHDAOUI.

Title. *Special Tilings and Self-Convolutions of Fibonacci Numbers*

Abstract.

We study tilings of a board using squares and dominoes in which exactly k of the squares are distinguished as “special”. Counting such tilings yields a triangular array $F(n,k)$ that satisfies a three-term recurrence, admits a closed-form expression involving binomial coefficients, and coincides with the OEIS sequence A037027. A central observation is that the k -th column of this triangle equals the k -th self-convolution of the Fibonacci sequence, providing a natural combinatorial interpretation for classical Fibonacci convolution identities. We derive vertical, horizontal, and double generating functions for the triangle. The horizontal generating functions are identified as evaluations of Fibonacci polynomials, and are linked to Chebyshev polynomials of the second kind. We also establish several tiling identities and show that well-known sequences appear along diagonals, among them the Pell numbers as row sums. Finally, we introduce a companion triangle defined by marking dominoes instead of squares, and construct an explicit bijection between the two arrays.