There is only one Kam Curve

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(joint work with C. Carminati and D. Sauzin)

Abstract:
We consider the standard family of area-preserving twist maps of the annulus and the corresponding KAM curves. Addressing a question raised by Kolmogorov, we show that, instead of viewing these invariant curves as separate objects, each of which having its own Diophantine frequency, one can encode them in a single function of the frequency which is naturally defined in a complex domain containing the real Diophantine frequencies and which is monogenic in the sense of Borel; this implies a remarkable property of quasianalyticity, a form of uniqueness of the monogenic continuation, although real frequencies constitute a natural boundary for the analytic continuation from the Weierstrass point of view because of the density of the resonances.