

PROGRAMME THÉMATIQUE
« POINTS RATIONNELS, COURBES RATIONNELLES ET COURBES ENTIÈRES SUR LES VARIÉTÉS ALGÈBRIQUES »
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THEMATIC PROGRAM
“RATIONAL POINTS, RATIONAL CURVES AND ENTIRE HOLOMORPHIC CURVES ON ALGEBRAIC VARIETIES”
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The Büchi K3 surface and its rational points

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In order to extend Matiyasevich’s resolution of Hilbert’s Tenth Problem, Büchi introduced a sequence of affine algebraic surfaces : he showed that if the surfaces in this sequence eventually only have trivial integral solutions, then the proof of undecidability can be extended to the case of systems of diagonal quadratic equations. Vojta later showed that a weak form of the Lang’s Conjectures implies that, with finitely many exceptions, the ”Büchi surfaces” do indeed only have trivial integral solutions.

In my talk I will report on joint work in progress with M. Artebani and A. Laface on the rational (not necessarily integral !) points of the first non-rational surface in Büchi’s sequence. I will mention some of the geometric properties of this surface and show that it is a moduli space of vector bundles. The modular interpretation of this problem naturally leads to a question on integral structures on a moduli spaces of vector bundles, to which we do not know the answer.

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