Research Highlight: Unique ergodicity for foliations in P^2 with an invariant curve

Work of

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A generic polynomial Ordinary Differential Equation in two complex variables defines a dynamical system. Its solutions describe a singular foliation in the complex plane (phase space) whose leaves are Riemann surfaces which may be dense in the plane. In collaboration with Professor Nessim SIBONY (Paris 11 University), Professor DINH Tien Cuong (National University of Singapore) proved that there is a unique harmonic current of unit mass directed by the foliation. Moreover, this is the current defined by the line at infinity. In other words, all leaves of the foliation have a similar behavior: they pass more time near infinity than inside the complex plane. Unique ergodicity is one of the strongest ergodic properties in the theory of dynamical systems.

Reference:

T.C. Dinh, N. Sibony, “Unique ergodicity for foliations in P^2 with an invariant curve”. Inventiones Mathematicae, 211, No. 1 (2018): 1-38.