Dynamics and Lie Theory Seminar

The mathematics of love: classification

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Abstract. The first mathematical model describing the dynamics of love was proposed in [1] based on a system of ordinary differential equations. Since then, there have been several works devoted to improve these models (see compilations in [2, 3]). In this talk, we will present a mathematical model for the dynamics of love in the case of linear couples. We will then discuss the full classification of linear couples in terms of the personalities of the two individuals of a couple, and we will present the possible outcomes for different kinds of couples based on the stability properties of the equilibrium points obtained from the differential equations. We will determine the conditions that must be satisfied so that the couples have a happy life together. Time allowing, we will discuss some specific properties of nonlinear couples.

References

[1] Strogatz, S.H. "Love affairs and differential equations", *Math. Magazine*, 61, p35, 1988.

[2] Gottman, J.M., Murray, J.D, Swanson, C.C., Tyson, R., Swanson, K.R., "The Mathematics of Marriage: Dynamic Nonlinear Models", Bradford Book, MIT Press, Cambridge, MA, USA, 2002.

[3] Rinaldi, S., Della Rossa, F., Dercole, F., Gragnani, A., Landi, P. "Modeling Love Dynamics", World Scientific Series on Nonlinear Science Series A — Vol. 89, Danvers, MA, USA, 2016.