MR1321651 (95k:57032) 57R25 (58F22 58F25)

Ghys, Étienne (F-ENSLY-PM)

Construction de champs de vecteurs sans orbite périodique (d'après Krystyna Kuperberg). (French. French summary) [Construction of vector fields without periodic orbits (after Krystyna Kuperberg)]

Séminaire Bourbaki, Vol. 1993/94.

Astérisque No. 227 (1995), *Exp. No.* 785, 5, 283–307.

This is a survey article about a smooth counterexample to the Seifert conjecture due to K. M. Kuperberg [Ann. of Math. (2) **140** (1994), no. 3, 723–732; MR1307902 (95g:57040)], i.e. the existence of a nonsingular smooth flow without periodic orbits on S^3. After giving historical remarks and backgrounds, the author begins with a concrete construction of the flow. The exposition is so elaborate and "user friendly", with many enlightening figures, that the reader can read without pain. The proof that the constructed flow is actually without periodic orbits is also simple, deliberate and easy to follow. The later sections are devoted to the investigation of the dynamics of the flow. An especially interesting computer picture of the (unique) minimal set $\mathcal{M}$ by B. Sevenec is given, which strongly suggests that the covering dimension of $\mathcal{M}$ is 2. This is in fact proven under some extra condition. References on related topics are comprehensively collected.

Reviewed by *Shigenori Matsumoto*