



## Laboratory dynamos

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The magnetism of the planets, including Earth, is generated by dynamo action, i.e. self-generation of a magnetic field due to the fluid motion of liquid iron inside the planetary cores. During the last decades, laboratory experiments became an essential part of the research on dynamo action, complementing both observations and theory.

In this talk, I will review some recent results of the Von-Karman Sodium (VKS) experiment. The VKS experiment has been designed to achieve dynamo action in a turbulent flow of liquid metal. In this experiment, 150 liters of liquid sodium are stirred by the counter-rotation of two bladed discs in a cylindrical tank. When the discs are rotating sufficiently fast, a dipolar magnetic field, aligned with the axis of rotation, is generated by dynamo action. In addition, a lot of dynamical regimes can be observed, like chaotic polarity inversions of the field very similar to geomagnetic reversals. In some cases, the experiment can also generate hemispherical dynamos similar to some planetary fields.

These different behaviors will be described within the framework of simple theoretical models. I will discuss how these results, and the corresponding theoretical descriptions, can provide a better understanding of some aspects of the geomagnetic field dynamics. Finally, I will present current perspectives for the next generation of laboratory dynamo experiments.