

**Dr. Panagiotis Konstantis**

Universität Stuttgart

**Quaternionic line bundles,  $SU(2)$ -  
structures and the first cohomotopy  
group of spin 5-manifolds**

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**Seminarraum IGT, Raum 7.530, Pfaffenwaldring 57**

Abstract: In this talk we would like to close a gap in the classification of vector bundles over low dimensional manifolds. More precisely we will classify spinnable vector bundles (i.e. vector bundles with  $SU(2)$ -structures) over closed spin 5-manifolds  $M$ . The example of  $S^5$  shows that the two isomorphism classes of such vector bundles cannot be distinguished exclusively by characteristic classes.

We will see that the classification above is closely related to the classification of quaternionic line bundles over  $M$ , which are given by the first cohomotopy group of the spin 5-manifold. Those are classified by a characteristic class and a bordism theoretic invariant which we will introduce in this talk. Finally some applications to the topology of spin 5-manifolds will be presented at the end of the talk.

