MIT Topology Seminar

Monday, December 12, 4:30pm
MIT Room 2-142

Kiyoshi Igusa
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speaking on

Axiomatic higher torsion invariants and its consequences

Abstract: This talk is about the axiomatic approach to higher Franz- Reidemeister (FR) torsion. We consider smooth manifold bundles $M \to E \to B$ satisfying certain conditions (e.g., B simply connected is sufficient for all cases). For these bundles there are several real characteristic classes $\tau(E) \in H^{4k}(B; R)$: higher FR torsion, analytic torsion classes, higher Dwyer-Weiss-Williams (DWW) classes and tautological (Miller- Morita-Mumford) classes. However, for fixed k and fixed parity of the dimension of M there is only one characteristic class (up to a scalar multiple) satisfying two axioms.

Using this theorem, old theorems become clearer and there are some new results. So far, only the FR-torsion and tautological classes are known to satisfy the axioms. So they are proportional (old result). Sebastian Goette and I have some new results which imply equality with DWW torsion in some cases. Finally, I will attempt to extend axiomatic torsion to the equivariant case.

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