

Gauge theories and Atiyah algebroid

Gauge field theories are usually described in terms of principal bundles P over M where fields are connections on that bundles. Then, the Lagrangian is defined on a bundle of first jets J^1E where E is a bundle of connections on P . Since gauge connections are equivariant with respect to the group action, we can divide E by this action and obtain a bundle which has a structure of an Atiyah algebroid over M . In my talk I will show the pass from the principal bundle description to algebroidal one for gauge theories. In particular, I will show the basic objects (connection, curvature etc.) of gauge theories in a language of Atiyah algebroid and the process of generating the fields dynamics.

Despite the fact that it is a very natural idea, this approach is not very common in a literature yet.