1056-18-1937   **C. Joanna Su*** (`jsu@providence.edu`), Dept. of Mathematics and Computer Science, Providence College, Providence, RI 02918. *The First of the Three Homotopy Exact Sequences of a Fibration in Module Theory.*

The homotopy theory of modules was developed by Peter Hilton in the 1950s. It produced an analog to the existing homotopy theory in algebraic topology. However, while the concept of a fiber map in module theory seemed natural and did induce an exact sequence, the 'expected' homotopy sequence - one that is parallel to and carries the same character as the homotopy exact sequence of a fibration in topology - failed to be discovered at the time. It turns out that, in module theory, a fibration induces not one, but three homotopy sequences. Based on the character of each individual, they are named as the first, the expected, and the automatic homotopy exact sequences of a fibration, respectively. In this talk we discuss the first sequence. The significance of this sequence varies from different viewpoints. It is of interest because of its virtually identical appearance to the homotopy exact sequence of a fibration from topology. On the other hand, the sequence is in some ways "deficient" because it misses the expected isomorphism between the relative homotopy group and the homotopy group of the base space, a special feature in topology. Nevertheless, it carries an interesting new feature, namely, the relative homotopy group is isomorphic to the homotopy group of the 'fiber'. (Received September 22, 2009)