1106-L1-1855 **Michelle Zandieh*** (zandieh@asu.edu), **Megan Wawro** and **David Plaxco**. *Inquiry-Oriented Linear Algebra (IOLA): An RME-based instructional sequence for change of basis and eigentheory.*

We take a design research approach to developing an innovative instructional sequence that supports students' reinvention of change of basis and eigentheory in linear algebra. Initial versions of the sequence were used in classroom teaching experiments in 2009-2010, during which we collected written and video data of small group and whole class discussions. The sequence is based on the Realistic Mathematics Education heuristic of guided reinvention that facilitates student engagement in mathematical activity from which instructors can guide them to the reinvention of mathematical ideas. The task sequence builds from students' experiences with linear transformations in $\mathbb{R}^2$ to introduce them to the idea of stretch factors and stretch directions and how these create a non-standard coordinate system. Students also build from these experiences to develop geometric and algebraic understandings of eigenvalues and eigenvectors, and to reinvent the diagonalization equation $PDP^{-1}x = Ax$. Our project website contains instructor resources such as examples of student thinking and implementation notes for this task sequence. (Received September 15, 2014)