1113-06-56 **Bernd S. W. Schroeder*** (bernd.schroeder@usm.edu), Department of Mathematics, The University of Southern Mississippi, 118 College Drive, #5045, Hattiesburg, MS 39406. *Is there a Polynomial Algorithm that Certifies the Fixed Point Property for an Ordered Set with a Collapsible Chain Complex?* Preliminary report.

An ordered set has the fixed point property iff every order-preserving self map has a fixed point. An ordered set with a collapsible chain complex has the fixed point property. To determine if a given simplicial complex is collapsible is NP-complete. A point a in an ordered set P is called retractable to $b \in P$ iff the function that fixes all points in $P \setminus \{a\}$ and that maps a to b is an order-preserving retraction. An ordered set is connectedly collapsible iff it is either a singleton or it has a retractable point a so that $P \setminus \{a\}$ and the center-deleted neighborhood $\updownarrow a \setminus \{a\}$ are connectedly collapsible. Connectedly collapsible ordered sets have a collapsible chain-complex. Although the complexity of checking connected collapsibility is unknown, it can be shown that direct verification via the definition is worst-case exponential. For a subclass of the class of connectedly collapsible ordered sets, it is possible to certify the fixed point property in polynomial time, without verifying connected collapsibility. This talk will illustrate questions surrounding attempts to find algorithms that do the same thing in larger classes of ordered sets, such as ordered sets whose chain complexes are collapsible. (Received August 06, 2015)