Speaker: **Keppelmann, Edward**
Title: *The Later Years of Helga Schirmer*
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Abstract: The work of Helga Schirmer (from approximately 1988 onward) can be broken into the following categories:

1. Nielsen theories for extensions, transversal fixed points, and smoothness issues.
   Let $\bar{f} : \partial M \to \partial M$ be a smooth map on the boundary of a manifold M. How is it that there can be situations where the Nielsen number of the class of smooth extensions to M differs from the Nielsen number of the class of continuous extensions to M?

2. Root theories for iterates and maps of pairs.
   Roots of f^n and their irreducibility are developed. Results depend highly on the periodicity (or lack of it) for the target. A Nielsen root number for maps of pairs, it's computation, and sharpness properties are developed. Results depend highly on whether or not the target belongs to the subspace.

3. Hopf's Absolutgrad and root numbers.
   Uniting Hopf's work of the 1930s, the classical Brouwer degree from 1911, and modern Nielsen theory.

4. The Nielsen theory of bimaps.
   Bimaps are multivalued maps where the images of points consist of either one or two points. A Nielsen number and sharpness results are developed.

5. Periodic points on nonconnected spaces and pairs of spaces.
   The usual Nielsen periodic numbers $NP_n(f)$ and $N\Phi_n(f)$ for the number of periodic points of minimal period n and all $m|n$ are developed in these settings.

6. Coincidence theory of maps with boundary.
   A coincidence number for the setting of $g : (X, \partial X) \to (Y, \partial Y)$ and $f : X \to Y$ is developed. This is a homotopy invariant lower bound on the size of the coincidence set for f (any homotopy) and g (as a map of pairs).

7. Prescribing fixed points and excluding periodic points.
   Situations are developed where data such as a certain homotopy class and prescribed fixed point set can be realized by a map with possibly no periodic points other than fixed points.

8. Triads
   Fixed point theory for triples of spaces and maps and homotopies which respect these is developed in a way which extends relative theory.

In this talk we will highlight some of the great moments of this impressive body of work. We will provide the potential reader of these papers with a pocket guide to the structure of these theories and the types of calculations and observations obtained. In all cases these papers are exceedingly interesting and valuable. They are written with extreme clarity and precision - they are a gift to mathematics which have already planted and no doubt will continue to plant the seeds for numerous exciting future projects.[1]

[1]The set of joint authors on these papers is { Robin Brooks, Robert Brown, Robert Greene, Philip Heath, BoJu Jiang, Cheng Ye You }.