**Title:** Fractional Signals and Systems

**Speaker:** Ran Tao (Beijing Institute of Technology)

**Abstract:** The detection and identification of high speed/high acceleration targets, acquisition and tracking high dynamic measurement and control communication signal are frontier and difficult problems in field of air defense, missile defense and TT&C, where it demands highly for precision and real-time of non-stationary signal processing and requires a new signal processing theory and method. The fractional Fourier transform and the linear canonical transform as novel mathematical tools, with their basic function changing from the sine signals to the chirp signal, have the potential of dealing with the non-stationary signals, which attracts much attentions of the international famous scholars in this field. Their applications have already been intensively studied during the last few decades with excellent results. Therefore, the fractional domains (for short for fractional Fourier transform domain and linear canonical transform domain) signal analysis and processing can provide us more excellent properties in many cases, these properties make fractional order system more adequate than usually adopted integer order one. Although fractional domain signal processing has become a more and more popular tool for filtering and parameter estimation, many problems remain to be explored and solved. We will review and examine the latest developments and trends in fractional domain signal processing.