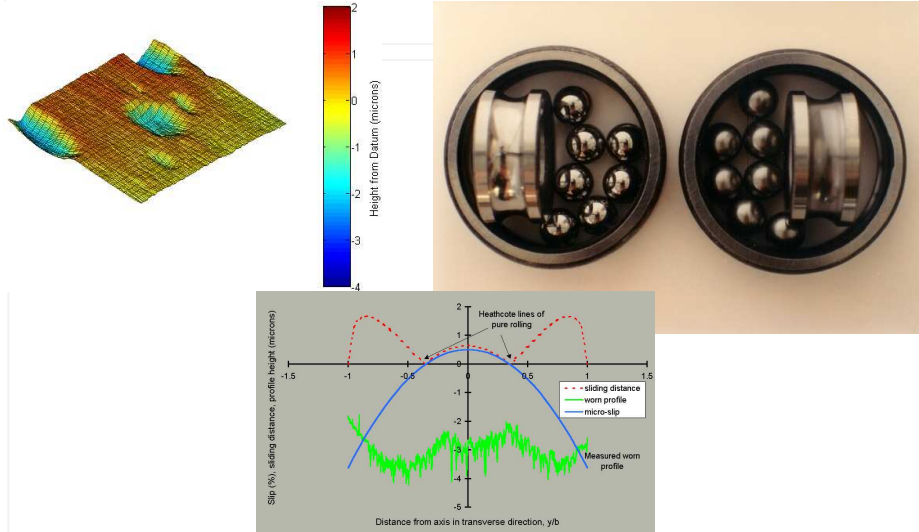
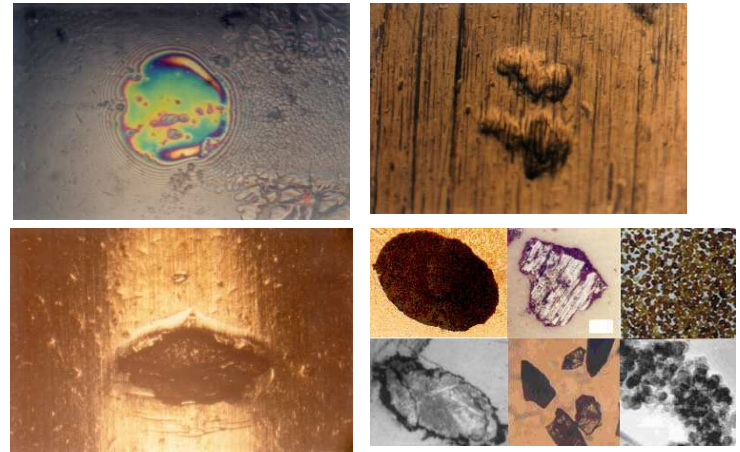


# Debris in Rolling Bearings

## Debris is a Major Cause of Early Bearing Failure

- Particles get entrained into the contacts between balls and rollers and dent the surfaces.
- Harder, tougher particles cause the biggest dents.
- The dents can act as an initiator for rolling contact fatigue.
- Or lots of small dents lead to wear and an increase in bearing clearance.
- Aim was to develop benchmark tests for friction modifiers



## Results

- Optical EHL provides a good way to understand how particles enter contacts.
- Dent severity maps have been produced to indicate the most severe debris.
- Fatigue life maps are created by predicting the over-rolling stress
- Wear models are used to predict abrasion from the particle size, bearing speed, and microslip.