I think we should be looking at short term solutions (model corrections with scientific justification; See Sundaresan's paper on subgrid model: Ind. Eng. Chem. Res. 2005, 44, 6022-6037) to keep the CFD modeling for multiphase flows practical in the chemical industry and at the same time look for long term solutions with some well defined experiments (See J.S. Curtis paper about pneumatic conveying correlations for pressure drop: Ind. Eng. Chem. Res. 2005, 44, 5090-5098)

- Particle size distribution; particle shape (short term)
- Particle-particle interaction and inter-particle forces (when to neglect?)
- Interphase heat transfer (short term)
- Drag force (Is it final; aren't all drag models producing similar values? If not, why?)