IFPRI BRIEF TEMPLATE

Check One: ☒**Project** ☐**Review** ☐**Collaboration**
☐**Workshop** ☐**Other**

Descriptive Title	Contact dynamics of multi-phase colloidal suspensions
Working Title[1]	Multi-phase colloidal suspensions
Technical Area[2]	Wet Systems
Date	
Short Description	The wetting and dispersion of gums, biomacromolecules (starches, celluloses), and other fine powders requires and the design of, or is inhibited by, particle-stabilized structures, such as Pickering emulsions, Pickering foams and bijels, requires the characterization and modeling of contact between multiple-phases (solid-liquid-gas). A first-principles understanding of especially the dynamics of these processes remains an outstanding problem. This project seeks to advance the fundamental interface science driving processes of dispersion and stabilization.
Objectives	Study the contact dynamics during processing, such as contact angle hysteresis, may play a role in the static stability and should be investigated. Both long- and short-time factors should be considered. These factors may include gravitational settling/creaming, Oswald ripening, film drainage, etc. Produce a method to predict the static stability of particle stabilized (Pickering) emulsions and/or foams based on relating particle characteristics (size, shape, roughness, interparticle forces, etc.), solid loading, processing history, and liquid viscosity The project will use Simplified Industrial Formulations (SIFs) to investigate the emulsion stability, outline key factors influencing the stability and perhaps determine a predictive model.
Scope	Particles are limited to SIFs. liquid(s) should be Newtonian. Solid loading between 1 and 50 vol% should be considered. The project should consider the emulsification/foaming method, but only the static stability should be considered.

Recommended Contractors (2 or 3)

[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

Name	Institution	Email Address
Bernard P. Binks	University of Hull (UK)	b.p.binks@hull.ac.uk
Ali Mohraz	University of Irvine (US)	mohraz@uci.edu
Sven H. Behrens	Georgia Tech (US)	sbehrens@gatech.edu
Paolo Colombo	University of Padua (IT)	paolo.colombo@unipd.it
Lucio Isa	ETH Zürich	lucio.isa@mat.ethz.ch
Paul S Clegg	University of Edinburgh (UK)	paul.clegg@ed.ac.uk

Submitted By:	
Name	**Organization**
Brian Levy-Polis	FMC
Vidya Vidyapati	P&G
Daren Swanson	EnviroDiamond
Joe Schlude	USG
Tom Szymanski	SG
Claire Gaiani	University of Lorraine
Vincenzino Vivacqua	Johnson Matthey
Erin Koos	KU Leuven