

Food sciences as emerging field in neutron scattering

Many different topics:

- Stabilizing Emulsions
- Processing
- Extreme conditions
- In situ/operando experiments

Benefits:

Understanding of proteins from a different perspective.

Understanding fundamental processes and mechanisms.

Support the industry with their formulations/processes.

Polymers:

- Cellulose for applications
- Extreme conditions
- Applied

Bio / proteins:

- In situ / in vivo
- (support from food science?)

Membranes:

- Natural lipid systems
- Curvature as one ingredient

Generally: Fluids

- Binary fluids (liquid-liquid phase sep. → ILL strategy)
- Deep eutectic solvents
- Ionic liquids
- (DES & ILs) as oils in microemulsions
- (DES & ILs & μ E) in porous materials
- Fluids for electrolytes
- Simple fluids (revival)
- Food emulsions

- Processing
- Extreme conditions

- Applied (Industry)
- Biological relevance

User Needs

- Extreme conditions
- Processes in situ / operando

- Custom made sample environment at the instrument
- Free access / wider room at the sample position
- Defined interface (media/control)
- Support by local contacts (specificities of instrument)
- In situ IR, UV/Vis, Raman etc.

- Structure and dynamics !!!
- Wide angle access (structure and dynamics)

User Needs

- Less experienced users
- Wider range of complimentary methods
- AI Support in model selection
- Modelling / Simulation support – connection to community

Try to address new emerging fields

Industries <-> universities <-> research (neutrons)

Smaller showcases...

Corner Discussions – NOTES – 11.07.2025

- Bring experts together – mediating people needed that understand neutrons and a new emerging field (the example was medical sciences – but also applies to industries)
- Joint efforts from all sources (smallest ones to the big ones). All can contribute in their own way.
- Smaller sources can contribute seriously to scientific output (top end experiments that don't need highest flux, but also precharacterizations, educational purposes) and some scientists just need to try out something without too big pressure for success.
- More sources welcome – would feed and nourish the chain from education to top end research. **THERE IS MORE POTENTIAL.**
- Missing NIST and FRM2 not beneficial in this sense.
- Specificities need to be clear (such as): Pulsed sources for (unspecific) wide Q-range scans – reactors for focused (limited) Q-range experiments (when you already know what to look for)
- Building scientific networks from the sources overarching many universities and many fields (and industries) that finally big problems can be tackled efficiently.