

Alan Ryder, PI

- Personal Professor in Chemistry at NUI Galway
- SFI PI (*Advanced Analytics for Biological Therapeutic Manufacture*)
- Director of Nanoscale Biophotonics Laboratory (www.nuigalway.ie/nanoscale)



Research Field

Analytical Science is a multi-disciplinary endeavor that seeks the best and most effective methods for measuring materials:

- New paradigms for the quantitative and qualitative analysis of small & large molecule APIs and processes.
- Spectroscopy & Chemometrics.
- Multi-disciplinary approaches to solving analytical challenges.

Scientific Impact

- > 75 peer-reviewed publications & reviews.
- H-index of 22, > 1500 citations.
- 3 patents issued (2 licensed).
- > 20 invited seminars or lectures.
- Graduated 15 PhD and 4 MSc students.
- >10 M€ in funding or which ~30% has come direct from industry.

Technological Impact

Analytical Science enables better understanding and control of all materials & processes:

- Analytical Methods: rapid measurement technologies (spectroscopy) and chemometric data analysis to deliver robust, fast, & effective analysis.
- Pharmaceuticals: better understanding, control and monitoring of processes and APIs.

Pharmaceutical Materials

Goal: Ionic cocrystals for use in medicines.

Why: Ionic cocrystals can greatly change properties such as solubility and stability without changing chemical structure of a drug molecule = 505(b)(2)

Who: Dr. Ewa Patyk-Kazmierczak and a team of post-grad students



Rigid Porous Materials

Goal: Porous materials for commodity purification.

Why: Advanced porous materials can cut carbon capture costs by 90%, enable new carbon negative technologies and reduce commodity costs.

Who: Dr. David Madden and a team of post-docs and postgrad students

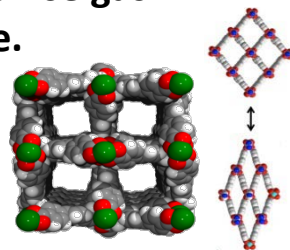
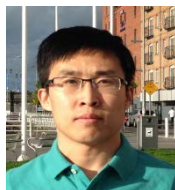


Flexible Porous Materials

Goal: Structures that breathe and flex when exposed to stimuli, e.g. pressure or heat.

Why: Flexible materials will revolutionise gas storage, including natural gas storage.

Who: Dr. Q.-Y. Yang and a team of post-graduate students



Green Chemistry

Goal: Synthesis of new functional molecules in high yield with no waste.

Why: Greater molecular diversity and low cost of synthesis will enable a wider range of applications.

Who: Ms. Rana Sanii and a team of post-graduate students

