

Reticular Materials Bootcamp

Workshop Series on Metal-Organic Frameworks and Related Materials

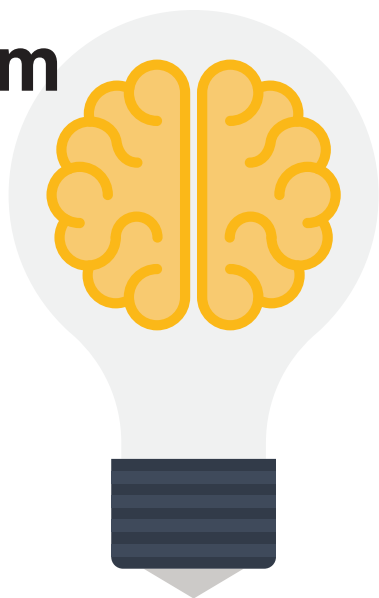
Metal-organic frameworks (MOFs) are made by linking inorganic and organic units by strong bonds (reticular synthesis). The flexibility with which the constituents' geometry, size, and functionality can be varied has led to more than 60,000 different MOFs being reported and studied since this field was established. The organic units are ditopic or polytopic organic carboxylates (and other similar negatively charged molecules), which, when linked to metal-containing units, yield architecturally

robust crystalline MOF structures with a typical porosity of greater than 50% of the MOF crystal volume. The surface area values of such MOFs typically range from 1000 to 10,000 m²/g, thus exceeding those of traditional porous materials such as zeolites and carbons. To date, MOFs with permanent porosity are more extensive in their variety and multiplicity than any other class of porous materials. These aspects have made MOFs ideal candidates for storage of fuels (hydrogen and methane), capture of carbon dioxide,

separation of industrially-relevant gases, harvesting water from desert air, delivery of drugs, water purification, and heterogeneous catalysis applications, to mention a few.

The Reticular Materials Bootcamp aims to provide you with tools to answer this question, by showing you how to rationally prepare, characterize, modify and shape MOFs into society's next-generation materials.

About the Program



This Bootcamp combines both lectures and hands-on experimentation in order to provide the participants with the fundamentals needed to begin research in reticular chemistry. In order to achieve this, we have gathered an impressive group of internationally recognized scholars and teachers, including Prof. Omar M. Yaghi (UC Berkeley, USA), Prof. Michael O'Keeffe (Arizona State University, USA), and Mr. Kyle E. Cordova (UC Berkeley, USA).

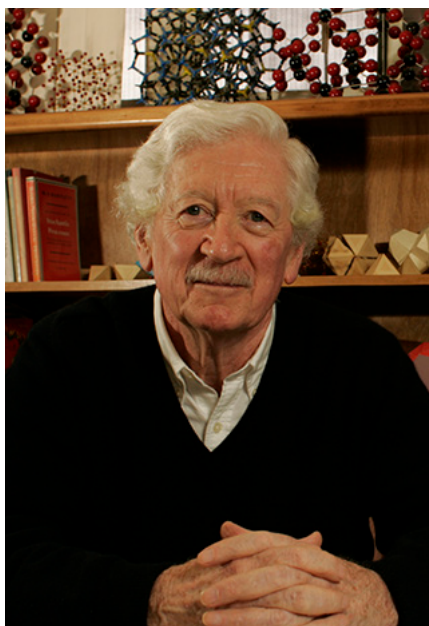
Speakers



Omar M. Yaghi

Omar M. Yaghi is the James and Neeltje Tretter Chair Professor of Chemistry at the University of California, Berkeley and the Founding Director of the UC Berkeley Global Science Institute.

He is widely known for the discovery and for pioneering the development of reticular chemistry, which has spawned several extensive classes of new materials: Metal-Organic Frameworks (MOFs), Covalent Organic Frameworks (COFs), and Zeolitic Imidazolate Frameworks (ZIFs).



Michael O'Keeffe

Michael O'Keeffe is the Regents' Professor of Chemistry at Arizona State University in Tempe, Arizona, USA.

His research is mainly concerned with the atomic and electronic structure and properties of crystalline inorganic solids. O'Keeffe's recent work has particularly focused on the geometry of periodic frameworks and its importance in crystal chemistry. His immediate goals are to design possible topologies, to evaluate which of these would serve as the basis for materials of interesting and useful properties, and to discover routes for their synthetic realization.



Kyle E. Cordova

Kyle E. Cordova is currently the Associate Director of the UC Berkeley Global Science Institute in Berkeley, California, USA.

His role is to design, implement and manage centers of research excellence worldwide. His research focuses on the design and discovery of new materials based on the principles of reticular chemistry for addressing challenges in clean energy, health, and environment.

BOOTC

Curriculum



Introduction to Reticular Chemistry: Discovery, Design, and Development

Session 1: Lecture

By Kyle E. Cordova

Monday, January 28th 1:00 PM

Location: F1 - 2022



Nets, Tilings, and Topological Crystal Chemistry - Part 1

Session 2: Lecture

By Prof. Michael O’Keeffe

Wednesday, February 6th 1:00 PM

Location: E1 - 1038



Nets, Tilings, and Topological Crystal Chemistry - Part 2

Session 3: Lecture

By Prof. Michael O’Keeffe

Thursday, February 7th 1:00 PM

Location: E1 - 1027



Synthesis and Characterization of Reticular Materials

Session 4: Lecture

By Kyle E. Cordova

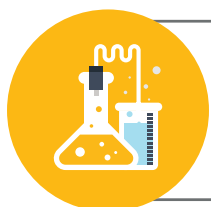
Monday, February 11th 1:00 PM

Location: F1 - 2022

Program Materials

All program materials, including PowerPoint presentations, will be made freely available to the participants.

CAMP



Synthesis, Solvent-Exchange, and Activation of MOFs and ZIFs

Session 5: Hands-On Experiments

By **Kyle E. Cordova**

Thursday, February 14th 1:00 PM

Location: F1 - 2022



Post-Synthetic Modification + Future Directions in Reticular Chemistry

Session 6: Lecture

By **Kyle E. Cordova**

Thursday, February 21st 1:00 PM

Location: F1 - 2022



The Allure of Metal-Organic Frameworks and Covalent Organic Frameworks

Session 7: Lecture

Prof. Omar M. Yaghi

Monday, February 25th 12:00 PM

Location: E1 - Auditorium (Male)



Anatomy of a High Impact Publication

Bonus Lecture

By **Kyle E. Cordova**

Date TBA

Location TBA

Certificate of Completion

Those participants that meet the attendance requirements will receive a Certificate of Completion signed by Dean of the College of Science, Professor Ahmed A. Murad, and UC Berkeley Professor Omar M. Yaghi.