# Yimin Mijiti

## Research interests

I am interested in a variety of topics in the studies of matter under extreme conditions using synchrotron based x-ray spectroscopy techniques. In particular, I am very interested in the behavior of disordered systems, such as the phenomena of polyamorphism in glasses and liquids under high pressure and temperature. Apart from the general studies of phase transitions in crystalline systems, I am also curious to various unusual properties (e.g., unconventional superconductivity, quantum criticality, formation of heavy fermions and non-Fermi liquids, valence instability) manifested by the strongly correlated electron systems under multi-extreme conditions of pressure, temperature and intense magnetic fields. I have passion for engaging with scientific instruments and their developments. I am experienced with the use of diamond anvil cells coupled with various characterization techniques including x-ray absorption spectroscopy, x-ray magnetic circular dichroism, x-ray diffraction, Raman and infrared spectroscopy.

## Education/Training/Employment

**National Intense Magnetic Field Laboratory (LNCMI-CNRS)** — Toulouse, France
Postdoctoral fellow — 03/2022–present

**European Syncrotron Radiation Facility (ESRF)** — Grenoble, France
visiting scientist — 03/2021–12/2022

- research topic: "Time resolved high pressure high temperature studies of functional materials."
  Supervisors: Prof. Andrea Di Cicco, Dr. Angelika Rosa

**Università di Camerino** — Camerino, Italy
Postdoctoral fellow — 01/2021–02/2022

- research topic: "Time resolved high pressure high temperature studies of functional materials."
  Supervisors: Prof. Andrea Di Cicco

**Università di Camerino/Synchrotron SOLEIL** — Camerino, Italy/Saclay, France
Ph.D. in theoretical and experimental physics-ciclo XXXII — 12/2016–09/2020

- Thesis: "Transitions and local properties uner extreme conditions probed by energy dispersive x-ray absorption spectroscopy."
  Supervisors: Prof. Andrea Di Cicco, Dr. Francois Baudelet

**Università di Camerino** — Camerino, Italy
M.S. in Physics — 10/2013–10/2016

- Thesis: "Characterization of SEI growth in ZFO based lithium ion batteries probed by x-ray absorption near-edge spectroscopy."
  Supervisor: Prof. Roberto Gunnella

**Capital Normal University** — Beijing, China
B.S. in Physics — 09/2008–07/2012

- Thesis: "Raman characterization of Graphene".
  Supervisor: Prof. Pei Jie Wang

## Activities, attended schools and conferences

**Symposium of Amorphous and High Entropy Alloys (virtual)** 11.2022
Institute: ZheJiang University Hangzhou, China
Presentations: one oral presentation (by invitation)

**XAFS18 international conference (virtual)** 07.2021
Institute: University of Sydney Sydney, Australia
Presentations: two presentations (oral and poster)

**SILS 2021 conference (virtual)** 06.2021
Institute: Università di Bologna Bologna, Italy
Presentations: two presentations (oral and poster)

**SILS 2019 conference** 09.2019
Institute: Università di Camerino Camerino, Italy
Presentations: two poster presentations

**School on high pressure techniques** 06.2019
Institute: European Synchrotron Radiation Facility (ESRF) Gernoble, France

**XAFS17 international conference** 07.2018
Institute: Jagiellonian University Krakow Krakow, Poland
Presentations: one poster presentation

**Spring school on material science under extreme conditions** 04.2018
Institute: University of Bordeaux Bordeaux, France

**XIV summer school on synchrotron radiation** 09.2017
Institute: Syncrhotron Elettra Trieste, Italy

## Teaching experiences

- **Teaching Assistant** at Università di Camerino 2018-2019 academic year, $2^{nd}$ semester
  Course: exercises on the main topics of classical physics, for the degree course of : Biosciences/Biotechnology (L-13) and Geology (L-34).
  Total hours: 32

## Scholarships and Awards

- **"Go for It" postdoctoral fellowship** 01/2021–02/2022
  Institute: Conference of Italian University Rectors (CRUI), Università di Camerino Camerino, Italy
- **Scholarship to support scientific research and activities** 02/2020–12/2020
  Institute: School of science and technology, Università di Camerino Camerino, Italy
- **Full scholarship for the Ph.D. Program** 12/2016–12/2019
  Institute: School of advanced studies, Università di Camerino Camerino, Italy
- **Full scholarship for the Masters Program** 10/2013–04/2016
  Institute: ERSU di Camerino Camerino, Italy
- **Excellent student award** 04/2010
  Institute: Physics Department Capital Normal University Beijing, China

## Professional skills

- **High pressure experiemnts with DACs**
  Design and developments of resistively heated DACs.
  Polishing of anvil seats, gluing/installing anvils, anvil allignments.
  Gasket preparations (indentation, drilling), sample (liquid,solid) loading.
- **Measurements, data analysis and interpretations of the following characterization techniques:**
  Static or time resolved x-ray absorption spectroscopy (XAS) with dispersive or scanning geometry geometry.
  XMCD, combined XAS and XRD experiments under high pressure and pulsed magnetic fields
  X-ray fluorescence (XRF).
  Raman and infrared (IR) spectroscopy.
- **Data analysis and simulation:**
  MXAN and CTM4XAS codes for theoretical calculations of the XANES.
  GNXAS and Demeter (include Artemis and Athena) suits for analysis of the EXAFS signal.
  Powder Cell and Area Diffraction Machine,Dioptas programs for XRD analysis.
  Gnuplot and Origin programs for data visualization.

## Programming

- **Fortran:** intermediate level, for scientific calculations
- **Matlab:** basics, for data analysis
- **Python:** advanced level, for data analysis

## Languages

- **Uighur:** mother language
- **English & Chinese & Turkish:** proficient
- **Italian French:** A2-B1, intermediate level

## Experiences with the use of synchrotron radiation

I am the co-proposer of nearly 25 proposals submitted to the XAS, XRD and IR beamlines of SOLEIL (Saclay, France), Elettra (Trieste, Italy), and ESRF (Grenoble, France) synchrotron facilities. Among those, 16 proposals were written and submitted by myself as the main proposer (12 of them have been accepted after the first submission or re-submission). I have participated many sessions of experiments at different synchrotron facilities/beamlines as the responsible user (in several occasions, leading teams composed by myself and other students).

## List of publications & manuscripts


[1] F. Paparoni, **Y. Mijiti**, H. Darjazi, F. Nobili, A. Zitolo, E. Fona, A. Di Cicco, R. Gunnekka, and J. Rezvani, "Oxide coating role on the bulk structural stability of active LiMn2O4 cathodes," *Journal of Physical Chemistry C*, under under review, 2023.

[2] J. Rodrigues, A. Rosa, J. Gainza, **Y. Mijiti**, G. Garbarino, T. Irifune, N. Nemes, J. Martinez, J. Alsono, and O. Mathon, "Mode analysis and pressure/temperature phase diagram for PrNiO3 nickelate by combining SXRD and XANES techniques,", under preparation, 2023.

[3] J. E. Rodrigues, W. Rosa, **Y. Mijiti**, M. Ferrer, M. T. Fernandez-Diaz, J. L. Martinez, R. V. Goncalves, A. C. Hernandes, and J. Alsono, "Neutron diffraction investigation and dielectric behavior in Fe2TiO5 pseudobrookite," *Journal of Applied Physics*, under review, 2023.

[4] **Y. Mijiti**, F. Duc, O. Mathon, T. Irifune, and C. Strohm, "Local structure and temperature and pressure dependence of average sm valence in $SmB_6$ probed by x-ray absorption spectroscopy,", under preparation, 2023.

[5] **Y. Mijiti**, M. Durandurdu, A. Trapananti, J. Rezvani, T. Shinmay, T. Irifune, O. Mathon, A. Rosa, and A. Di Cicco, "Structural and electronic changes in $GeSe_2$ glass under ultra-high pressures probed by double-edge EXAFS measurements,", under preparation, 2023.

[6] **Y. Mijiti**, J. Rodrigues, F. Capitani, Y. Bartak, M. Perri, L. Silenzi, T. Irifune, O. Mathon, A. Rosa, and A. Di Cicco, "Complex phase behavior of amorphous selenium under high pressure,", under preparation, 2023.

[7] **Y. Mijiti**, J. Rodrigues, G. Tchoudinov, F. Paparoni, T. Shinmay, T. Irifune, O. Mathon, A. Rosa, and A. Di Cicco, "EXAFS investigations on the pressure induced local structural changes of $GeSe_2$ glass under different hydrostatic conditions," *Journal of Physics: Condensed Matter*, under review, 2023.

[8] F. Paparoni, **Y. Mijiti**, S. Kazim, M. Minicucci, N. Pinto, A. D'Elia, S. Macis, C. Kim, S. Huh, R. Gunnella, *et al.*, "Metallic interface induced ionic redistribution within amorphous moo3 films", *Advanced Materials Interfaces*, p. 2 200 453, 2022.

[9] S. Deng, M. R. Gigliobiancoa, **Y. Mijiti**, M. Minicucci, M. Cortese, B. Campisi, D. Voinovich, G. Censi, L. Pietro, *et al.*, "Dually cross-linked core-shell structure nanohydrogel with redoxndash;responsive degradability for intracellular delivery", *Pharmaceutics*, vol. 13, no. 12, 2021.

[10] S. Deng, A. Iscaro, G. Zambito, **Y. Mijiti**, M. Minicucci, M. Essand, C. Lowik, M. Muthana, R. Censi, L. Mezzanotte, *et al.*, "Development of a new hyaluronic acid based redox-responsive nanohydrogel for the encapsulation of oncolytic viruses for cancer immunotherapy", *Nanomaterials*, vol. 11, no. 1, p. 144, 2021.

[11] **Y. Mijiti**, K. Chen, J. E. F. S. Rodrigues, Z. Hu, L. Nataf, A. Trapananti, A. Di Cicco, and F. Baudelet, "Crystal and electronic structure of $Co_3O_4$ spinel under pressure probed by XANES and Raman spectroscopy", *Phys. Rev. B*, vol. 103, p. 024 105, 2 Jan. 2021.

[12] **Y. Mijiti**, A. Trapananti, L. Nataf, F. Baudelet, T. Shinmei, T. Irifune, J. Z. Jiang, and A. Di Cicco, "Local structure of ga85: 8in14: 2 eutectic alloy and its pressure-temperature melting line", *physica status solidi (RRL)–Rapid Research Letters*, 2021.

[13] S. J. Rezvani, **Y. Mijiti**, F. Galdenzi, L. Boarino, R. Gunnella, A. Marcelli, N. Pinto, and A. Di Cicco, "Structural properties of porous silicon nanowires: A combined characterization by advanced spectroscopic techniques", in *Synchrotron Radiation Science and Applications*, Springer, 2021, pp. 191–201.

[14] S. Rezvani, **Y. Mijiti**, and A. Di Cicco, "Porous silicon nanowires phase transformations at high temperatures and pressures", *Applied Physics Letters*, vol. 119, no. 5, p. 053 101, 2021.

[15] **Y. Mijiti**, M. Perri, J. Coquet, L. Nataf, M. Minicucci, A. Trapananti, T. Irifune, F. Baudelet, and A. Di Cicco, "A new internally heated diamond anvil cell system for time-resolved optical and x-ray measurements", *Review of Scientific Instruments*, vol. 91, no. 8, p. 085 114, 2020.

[16] **Y. Mijiti**, A. Trapananti, M. Minicucci, M. Ciambezi, J. Coquet, L. Nataf, F. Baudelet, and A. Di Cicco, "Development of a high temperature diamond anvil cell for x ray absorption experiments under extreme conditions", *Radiation Physics and Chemistry*, vol. 175, p. 108 106, 2020, 17th International Conference on X-ray Absorption Fine Structure - XAFS2018, ISSN: 0969-806X.

[17] S. Rezvani, **Y. Mijiti**, R. Gunnella, F. Nobili, A. Trapananti, M. Minicucci, M. Ciambezi, D. Bresser, S. Nannarone, S. Passerini, *et al.*, "Structure rearrangements induced by lithium insertion in metal alloying oxide mixed spinel structure studied by x-ray absorption near-edge spectroscopy", *Journal of Physics and Chemistry of Solids*, vol. 136, p. 109 172, 2020.

[18] K. Chen, F. Baudelet, **Y. Mijiti**, L. Nataf, A. Di Cicco, Z. Hu, S. Agrestini, A. C. Komarek, M. Sougrati, J. Haines, *et al.*, "Revisiting the phase transition of magnetite under pressure", *The Journal of Physical Chemistry C*, vol. 123, no. 34, pp. 21 114–21 119, 2019.

[19] J. Meng, K. Chen, **Y. Mijiti**, D. Chen, F. Choueikani, Z. Zou, L. Wang, G. Mu, W. Geng, Q. Kong, *et al.*, "Charge-transfer-induced interfacial exchange coupling at the Co/$BiFeO_3$ interface", *Physical Review Applied*, vol. 12, no. 4, p. 044 010, 2019.

[20] K. Chen, **Y. Mijiti**, S. Agrestini, S.-C. Liao, X. Li, J. Zhou, A. Di Cicco, F. Baudelet, L. H. Tjeng, and Z. Hu, "Valence state of Pb in transition metal perovskites $PbTMO_3$ (TM= Ti, Ni) determined from x-ray absorption near-edge spectroscopy", *physica status solidi (b)*, vol. 255, no. 6, p. 1 800 014, 2018.

[21] **Y. Mijiti**, K. Chen, F. Choueikani, A. Di Cicco, and F. Baudelet, "Collapse of itinerant ferromagnetism in $CoS_2$ under pressure: An x-ray absorption spectroscopy study", *Phys. Rev. B*, vol. 98, p. 184 423, 18 Nov. 2018.