

Preface ICBBM 2021

Dear colleagues,

Despite the exceptional COVID-pandemic situation we have been experiencing for over a year around the world, we have maintained our ICBBM face-to-face event in Barcelona as planned in Belfast in June 2019. This decision is made necessary by the fact that we believe that presentation of progress in knowledge and intense exchanges cannot wait several more months.

Yes climate change is much more dramatic for humanity, and we must change our ways of building.

Yes, we have the immense responsibility to continue our march forward by taking the maximum sanitary precautions.

This march started in 2015 while the first International Conference on Bio-based Building Materials (3BM) ICBBM2015 was organised in Clermont-Ferrand. More than 150 participants from 32 countries attended the conference. Approximately 120 papers were selected for publication in the proceedings. In 2017 a significant progress was made in the research, development, and implementation of 3BM. In 2017, the second International Conference on Bio-Based Building Materials ICBBM-EcoGrafi 2017 was held in the same city. More than 260 participants from a wide range of academics, researchers, students, designers, policymakers, and end-users from 40 countries and 130 papers were presented at the conference. The third series ICBBM2019 was held on 26-28 June 2019 in Belfast (UK) with more than 150 people (<https://www.qub.ac.uk/sites/ICBBM2019/>).

ICBBM2021 was an international forum for information dissemination and exchange, discussions, and debates on research and practice related to innovative bio-construction materials and technologies with objectives for sustainable development. The purpose of this international conference was to present the latest available scientific and technical information in bio-based building materials. To dynamically address these and to capitalise on real opportunities which they present for the future, University Clermont Auvergne, Queen's University Belfast and Universitat Politècnica de Catalunya have united leading building and civil engineering sector players and international experts, and other key stakeholders in a framework of this a milestone event in 2021's professional and business calendar. Working together in an international context is nowadays a basic condition for progress.

The conference attracted 180 people a wide range of academics, scientists, researchers, students, designers, policymakers, and other industrialists from a wide variety of backgrounds, including fields of engineering, materials, sustainable development, architecture, and ecological technologies, biomaterials, materials sciences, environmental engineering and government agencies, end-users, etc. Participants have the opportunity to share ideas on the state-of-the-art innovations, state-of-the-practice and future trends of bio-based building materials and sustainable materials used in construction.

The ICBBM2021 proceedings include the keynote lectures and papers presented at ICBBM2021 conference. It consists of a book of full texts of papers and extended abstracts: 8 plenary papers and 160 papers from over 28 countries.

The plenary keynotes and papers cover the wide spectrum of the topics related to natural fibres and materials, mechanical performances of bio-based building materials and design properties, hygroscopic and hygrothermal properties of biomaterials, acoustic and durability performance of bio-materials, sustainability of bio-based materials, agro-by products, treatment of fibres, eco-friendly binders with low CO₂-emission and low embodied carbon energy, advances in research methodologies and Bio-materials testing, modeling building materials rammed earth, life-cycle assessment of materials, recycling materials, and others.

On behalf of the Local Organizing Committee of ICBBM2021, we would like to express our sincere thanks to all our contributors and participants for their carefully prepared, stimulating, and thought-provoking manuscripts; to the organizers of the organisers of the conference for their dedicated task.

Thanks are extended to the members of the International scientific committee to review the papers. Without their dedicated efforts, the proceedings could not have been published for distribution at the conference. The cooperation of the authors in accepting reviewers' suggestions and revising their manuscripts accordingly is greatly appreciated.

The organisation of a conference of this scale could not have been possible without the support and contributions of many organisations and individuals. This conference would not have been possible without the financial support given by two gold sponsors (Parexlanko and Vicat). We also value the financial support of Association Universitaire de Génie Civil AUGC and GdR MBS Matériaux de construction biosourcés (CNRS). We also thanks RILEM organization (The International Union of Laboratories and Experts in Construction Materials, Systems and Structures) for promoting our conference.

Thanks go to all those who have devoted their time and effort to the organization of the conference, especially Prof Evelyne Toussaint from University of Clermont Auvergne (France), and publication of the proceedings, especially Associate Professor Jonathan Page from University d'Artois (France), including secretarial staffs and research students of Universitat Politècnica de Catalunya (Spain) for their diligent work in bringing this ICBBM2021 to success!

Barcelona, 15th June 2021

Chairs of the conference

Sofiane Amziane – University of Clermont Auvergne (France)

Mohammed Sonebi – Queens University Belfast (UK)

Local organisers of the conference

Mònica Ardanuy - Universitat Politècnica de Catalunya (Spain)

Laia Haurie Ibarra - Universitat Politècnica de Catalunya (Spain)