### **Preface**

This volume is a collection of edited scientific papers presented at the International Conference on *Mechanics of Masonry Structures Strengthened with Composites Materials* (**MuRiCo6**) held in Bologna (June 26-28, 2019).

The previous meetings, organised by AICO (Italian Association of Composites in Constructions, established in 1995), were held at University IUAV of Venice (years 2000, 2004, 2009) and at University of Bologna, campus of Ravenna (year 2014) and campus of Bologna (2017).

This International Conference, MuRiCo6, was organized by AICO under patronage and sponsorship of DICAM Department of University of Bologna and patronage of University of Roma Tre, and University of Miami.

It represents a forum to promote and exchange latest theoretical, computational and experimental research works finalised to the design of structural strengthening of historic masonry constructions.

The MuRiCo6 covers a wide range of topics:

- Analysis of mechanics of masonry and models;
- Testing and computational modelling of masonry macro-elements under static and dynamic loadings;
- Performance of strengthened masonry with composites (FRP, FRCM, TRM, SRG);
- Bond, local damage, fatigue and connections performance in masonry/composites coupling;
- Design approaches and inspection programs of masonry structures strengthening;
- Durability, health monitoring (optic fibres ...), maintenance and repair strengthened masonry;
- Advanced bio-composites and nanotechnology for strengthening historical constructions
- Appropriate composites technique evolution for historical constructions strengthening.
- Acceptance of composites technique application for seismic protection of monuments.
- Criticisms on existing guide lines, standards and praxis restoration rules on historical masonry/composites coupling.

The Editors would like to thank the members of the Steering Committee and all the members of the Scientific Committee for their suggestions and help for the success of the Conference. Furthermore, we express our gratitude to AICO, promoting and organizing the Conference with cooperation of the affiliated industrial partners G&P Intech, BIEMME and FIBRENET.

Finally, we would like to thank all those of the Organizing Committee, who helped us to organise this scientific event, in particular Dr. Daniela Bufo from AICO that was with us the driving force of the meeting at University of Bologna.

The Editors A. Di Tommaso, C. Gentilini and G. Castellazzi

ALMA MATER STUDIORUM University of Bologna, June 2019.

# **Committees**

Chairmen of the Conference	A. LA TEGOLA
	L. LA MENDOLA
A. DI TOMMASO	S. LENCI
A. NANNI	M. LUCCHESI
F. UBERTINI	F. MAZZOLANI
	C. MAZZOTTI
	G. MILANI
International Advisory Board (Invited)	M. PECCE
	C. PELLEGRINO
J. ADUE	R. OLIVITO
J. JASIENKO	C. POGGI
C. CARLONI	A. PROTA
M. De JONG	S. RUSSO
W. MERA	E. SACCO
M. MOSOARCA	M. SAVOIA
A. NANNI	A. TRALLI
D. OLIVEIRA	T. TROMBETTI
P. ROCA	THOMBETT
J. ROTS	
M. RAFI	Scientific Organizing Committee (Invited)
N. TARQUE RUIZ	setentine organizing committee (invited)
•	A D' TOMMA GO
K SAB	A Di TOMMASO
K. SAB K. SUBRAMANIAN	A. Di TOMMASO C. GENTILINI
K. SUBRAMANIAN	C. GENTILINI
	C. GENTILINI G. CASTELLAZZI
K. SUBRAMANIAN D. TEODOSSOPOULOS	C. GENTILINI G. CASTELLAZZI T. BAKER
K. SUBRAMANIAN	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI
K. SUBRAMANIAN D. TEODOSSOPOULOS	C. GENTILINI G. CASTELLAZZI T. BAKER
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO P. COLOMBI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI S. INVERNIZZI
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO P. COLOMBI A. CECCHI	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI S. INVERNIZZI G. LACIDOGNA
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO P. COLOMBI A. CECCHI E. COSENZA	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI S. INVERNIZZI G. LACIDOGNA G. LIGNOLA
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO P. COLOMBI A. CECCHI E. COSENZA G. de FELICE	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI S. INVERNIZZI G. LACIDOGNA G. LIGNOLA J. MYERS
K. SUBRAMANIAN D. TEODOSSOPOULOS  Italian Advisory Board (Invited)  M. AIELLO L. ASCIONE A. BARATTA A. BORRI C. BLASI M. BRUGGI A. CARPINTERI M. COMO P. COLOMBI A. CECCHI E. COSENZA G. de FELICE B. de NICOLO	C. GENTILINI G. CASTELLAZZI T. BAKER S. BARACCANI D. BARALDI F. BASTIANINI L. BEDNARZ A. BUSNELLI G. BOSCATO E. COISSON M. CORRADI F. FINELLI F. FOCACCI S. INVERNIZZI G. LACIDOGNA G. LIGNOLA J. MYERS M. PALERMO

## **Sponsors**

#### MuRiCo6 Patronages



www.aico-compositi.it



https://www.ordingbo.it



www.dicam.unibo.it



www.da.unibo.it



www.uniroma3.it





welcome.miami.edu

### **MuRiCo6 Supporters**



www.fibrenet.it



biemmebiagiotti.com





https://www.2si.it



www.ingenio-web.it