Curriculum

Nome Name:	MARCO
Cognome Surname:	ALFANO

ORCID:	0000-0001-8000-4092
Scopus Author ID:	n.d.
WOS Author ID:	n.d.
Sito WEB WEB site:	n.d.

POSIZIONE PROFESSIONALE ATTUALE / CURRENT PROFESSIONAL POSITION:

Posizione attuale Current position:	In servizio
Qualifica Qualification:	Professore Ordinario (L. 240/10)
Ateneo/Ente/Azienda University/Institution/Company:	Università degli Studi di MODENA e REGGIO EMILIA
Nazione Ateneo/Ente/Azienda University/Institution/Company Country:	ITA
Anno inizio Start Year:	2023
Anno fine End Year:	n.d.

PRECEDENTI ESPERIENZE LAVORATIVE (ULTIMI 10 ANNI) / PREVIOUS WORK EXPERIENCE (LAST 10 YEARS):

Qualifica Qualification:	Professore Associato (L. 240/10)

Ateneo/Ente/Azienda University/Institution/Company	University of Waterloo
Posizione Sede Lavorativi (indicare Nazione e Città) Workplace Location (specify Country and City):	Waterloo, Canada
Anno inizio Start Year:	2019
Anno fine End Year:	2023
Descrizione Description:	Associate Professor, Department of Mechanical and Mechatronics Engineering, University of Waterloo, 200 University Ave. West, N2L 3G1, Waterloo (ON)

Qualifica Qualification:	Ricercatore confermato
Ateneo/Ente/Azienda University/Institution/Company	Università della CALABRIA
Posizione Sede Lavorativi (indicare Nazione e Città) Workplace Location (specify Country and City):	Rende, CS, Italia
Anno inizio Start Year:	2011
Anno fine End Year:	2019
Descrizione Description:	

LINGUE / LANGUAGES:

Lingua Language:	Inglese
Scrittura Writing:	A1
Comunicazione Comunication:	A1

AREA/SETTORE SCIENTIFICO-DISCIPLINARE / AREA/SECTOR SCIENTIFIC-DISCIPLINARY

Area scientifico-disciplinare Area scientific-disciplinary:	Ingegneria industriale e dell'informazione
Area scientifico-disciplinare codice Area scientific-disciplinary code:	09
Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-Progettazione meccanica e costruzione di macchine

Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-IIND-03/A

DESCRIZIONE DEI PRINCIPALI RISULTATI SCIENTIFICI CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI MASSIMO 10 PUBBLICAZIONI) / DESCRIPTION OF THE MAIN SCIENTIFIC RESULTS ACHIEVED IN THE LAST 10 YEARS (WITH ATTACHED LIST OF MAXIMUM 10 PUBLICATIONS):

Descrizione Description:	*Over the past decade, my research has made impactful contributions to Solid Mechanics, with a focus on interface mechanics, adhesion science, and the structural behavior of lightweight and multi-material systems. I served as Ricercatore at the University of Calabria (Italy) until 2019, then as Associate Professor at the University of Waterloo (Canada) until 2023. I am now Full Professor at the University of Modena and Reggio Emilia (UniMore). My work integrates experimental methods, surface engineering, and computational modeling to understand how manufacturing processes affect structural performance. Central to my research is the design of reliable bonded interfaces, particularly in composite and layered materials. I have published 45 journal papers in top-tier venues including Journal of the Mechanics and Physics of Solids, International Journal of Solids and Structures, Composites Science and Technology, Advanced Materials, and ACS Applied Materials & Interfaces. My research has been supported by competitive funding from the Italian government, the Canada Foundation for Innovation (CFI), and the Natural Sciences and Engineering Research Council of Canada (NSERC). It is structured around three main themes: 1. Tailoring interfacial adhesion through surface engineering Using pulsed lasers, I have developed advanced surface treatments that enhance bonding by modifying interfacial morphology and chemistry. These treatments improve mechanical interlocking and enable energy dissipation, leading to tougher and more durable joints. This work also explores synergies between laser processing and additive manufacturing. 2. Architected interfaces and bondlines for damage tolerance I have pioneered the use of architected interlayers—such as patterned films and embedded 3D printed structures—to prevent crack propagation in adhesive joints. These innovations promote mechanisms like ligament bridging and crack-tip shielding, enabling a new class of damage-tolerant bonded structures. 3. Controlling crack growth via substrate architecture By engineering the architecture of the bonded materials, my research has demonstrated control over debonding and fracture processes. This includes the use of tailored geometries to trigger snap-through behavior that delays crack growth. Experimental studies are enhanced by mechano-luminescent coatings, which provide real-time visualization of stress waves and fracture events.*

	This research supports key challenges in advanced manufacturing and multi-material design, with applications in aerospace, automotive, and energy systems. It is rooted in international collaboration and has contributed to institutional priorities in sustainable, high-performance materials. At UniMore, my program continues to grow through interdisciplinary innovation and strategic impact.

PUBBLICAZIONI / PUBLICATIONS:

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Tao R., Li X., Yudhanto A., Alfano M., Lubineau G. (2020). On controlling interfacial heterogeneity to trigger bridging in secondary bonded composite joints: An efficient strategy to introduce crack-arrest features. COMPOSITES SCIENCE AND TECHNOLOGY, vol. 188, p. 1-11, ISSN: 0266-3538, doi: 10.1016/j.compscitech.2019.107964

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Morano, Chiara, Zavattieri, Pablo, Alfano, Marco (2020). Tuning energy dissipation in damage tolerant bio-inspired interfaces. JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS, vol. 141, p. 1-17, ISSN: 0022-5096, doi: 10.1016/j.jmps.2020.103965

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Pascuzzo A., Yudhanto A., Alfano M., Lubineau G. (2020). On the effect of interfacial patterns on energy dissipation in plastically deforming adhesive bonded ductile sheets. INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, vol. 198, p. 31-40, ISSN: 0020-7683, doi: 10.1016/j.ijsolstr.2020.04.001

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Tao, Ran, Li, Xiaole, Yudhanto, Arief, Alfano, Marco, Lubineau, Gilles (2020). Laser-based interfacial patterning enables toughening of CFRP/epoxy joints through bridging of adhesive ligaments. COMPOSITES. PART A: APPLIED SCIENCE AND MANUFACTURING, vol. 139, p. 1-11, ISSN: 1359-835X, doi: 10.1016/j.compositesa.2020.106094

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Yudhanto, Arief, Almulhim, M., Kamal, F., Tao, Ran, Fatta, L., Alfano, Marco, Lubineau, Gilles (2020). Enhancement of fracture toughness in

	secondary bonded CFRP using hybrid thermoplastic/thermoset bondline architecture. COMPOSITES SCIENCE AND TECHNOLOGY, vol. 199, p. 108346, ISSN: 0266-3538, doi: 10.1016/j.compscitech.2020.108346

Anno della pubblicazione Year of publication:	2021
Citazione Citation:	Yudhanto, Arief, Alfano, Marco, Lubineau, Gilles (2021). Surface preparation strategies in secondary bonded thermoset-based composite materials: A review. COMPOSITES. PART A: APPLIED SCIENCE AND MANUFACTURING, vol. 147, p. 1-23, ISSN: 1359-835X, doi: 10.1016/j.compositesa.2021.106443

Anno della pubblicazione Year of publication:	2022
Citazione Citation:	Tao, Ran, Li, Xiaole, Yudhanto, Arief, Alfano, Marco, Lubineau, Gilles (2022). Toughening adhesive joints through crack path engineering using integrated polyamide wires. COMPOSITES. PART A: APPLIED SCIENCE AND MANUFACTURING, vol. 158, p. 1-10, ISSN: 1359-835X, doi: 10.1016/j.compositesa.2022.106954

Anno della pubblicazione Year of publication:	2023
Citazione Citation:	Morano, Chiara, Terasaki, Nao, Gao, Tianyi, Lubineau, Gilles, Alfano, Marco (2023). Snap-through Crack Propagation in Architected Bonded Interfaces Analyzed Using a Mechanoluminescent SAO/E Coating. ACS APPLIED MATERIALS & INTERFACES, vol. 15, p. 40887-40897, ISSN: 1944-8252, doi: 10.1021/acsami.3c06656

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Morano C., Scagliola M., Bruno L., Alfano M. (2024). Crack propagation in adhesive bonded 3D printed polyamide: Surface versus bulk patterning of the adherends. INTERNATIONAL JOURNAL OF ADHESION AND ADHESIVES, vol. 131, p. 1-13, ISSN: 0143-7496, doi: 10.1016/j.ijadhadh.2024.103660

Anno della pubblicazione Year of publication:	2024
Citazione Citation:	Lubineau G., Alfano M., Tao R., Wagih A., Yudhanto A., Li X., Almuhammadi K., Hashem M., Hu P., Mahmoud H. A., Oz F. (2024). Harnessing Extrinsic Dissipation to Enhance the Toughness of Composites and Composite Joints: A State-of-the-Art Review of Recent Advances. ADVANCED MATERIALS, vol. 36, p. 1-38, ISSN: 0935-9648, doi: 10.1002/adma.202407132

DESCRIZIONE DEI PRINCIPALI PROGETTI DI RICERCA E PREMI CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI MASSIMO 10 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PRINCIPAL INVESTIGATOR O COORDINATORE LOCALE DI PROGETTI DI RICERCA COMPETITIVI NAZIONALI O INTERNAZIONALI, SIGNIFICATIVI PREMI CONSEGUITI PER LA PROPRIA ATTIVITÀ DI RICERCA)/ DESCRIPTION OF THE MAIN RESEARCH PROJECTS AND AWARDS AWARDED IN THE LAST 10 YEARS (WITH ATTACHED LIST OF MAXIMUM 10 ACHIEVEMENTS, INCLUDING, FOR EXAMPLE, PRINCIPAL INVESTIGATOR OR LOCAL COORDINATOR OF NATIONAL OR INTERNATIONAL COMPETITIVE RESEARCH PROJECTS, SIGNIFICANT AWARDS AWARDED FOR YOUR RESEARCH ACTIVITY):

Descrizione Description:	

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SVILUPPO DI RETI E RELAZIONI SCIENTIFICHE NAZIONALI E INTERNAZIONALI (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PARTECIPAZIONE O ORGANIZZAZIONE DI CONVEGNI NAZIONALI E INTERNAZIONALI; CONTRIBUTI A CONSORZI DI RICERCA) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF DEVELOPMENT OF NATIONAL AND INTERNATIONAL SCIENTIFIC NETWORKS AND RELATIONS (WITH ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, PARTICIPATION OR ORGANIZATION OF NATIONAL AND INTERNATIONAL CONFERENCES; CONTRIBUTIONS TO RESEARCH CONSORTIA):

Descrizione Description:	

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SUPPORTO ALLA COMUNITÀ SCIENTIFICA (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, RESPONSABILITÀ DI DIREZIONE DI COMITATI EDITORIALI; INCARICHI DI VALUTAZIONE DELLA RICERCA PRESSO ISTITUZIONI NAZIONALI O INTERNAZIONALI; RESPONSABILITÀ

ISTITUZIONALI ALL'INTERNO DELL'ISTITUZIONE DI APPARTENENZA O DI ALTRE ISTITUZIONI) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF SUPPORT TO THE SCIENTIFIC COMMUNITY (WITH ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, MANAGEMENT RESPONSIBILITIES OF EDITORIAL COMMITTEES; RESEARCH EVALUATION ROLES AT NATIONAL OR INTERNATIONAL INSTITUTIONS; INSTITUTIONAL RESPONSIBILITIES WITHIN THE INSTITUTION OF AFFILIATION OR OTHER INSTITUTIONS):

Descrizione Description:	

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI VALORIZZAZIONE DELLE CONOSCENZE (CON ANNESSO ELENCO DI MASSIMO 3 RISULTATI, RELATIVI ALLA PARTECIPAZIONE DEL CANDIDATO ALLE ATTIVITÀ DI VALORIZZAZIONE DELLE CONOSCENZE) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF KNOWLEDGE VALORIZATION (WITH ATTACHED LIST OF MAXIMUM 3 RESULTS, RELATING TO THE CANDIDATE'S PARTICIPATION IN KNOWLEDGE VALORIZATION ACTIVITIES):

Descrizione Description:	

Informazioni aggiornate alla data di candidatura 15-05-2025

MARCO ALFANO

Il presente curriculum costituisce allegato e parte integrante dell'incarico sottoscritto