

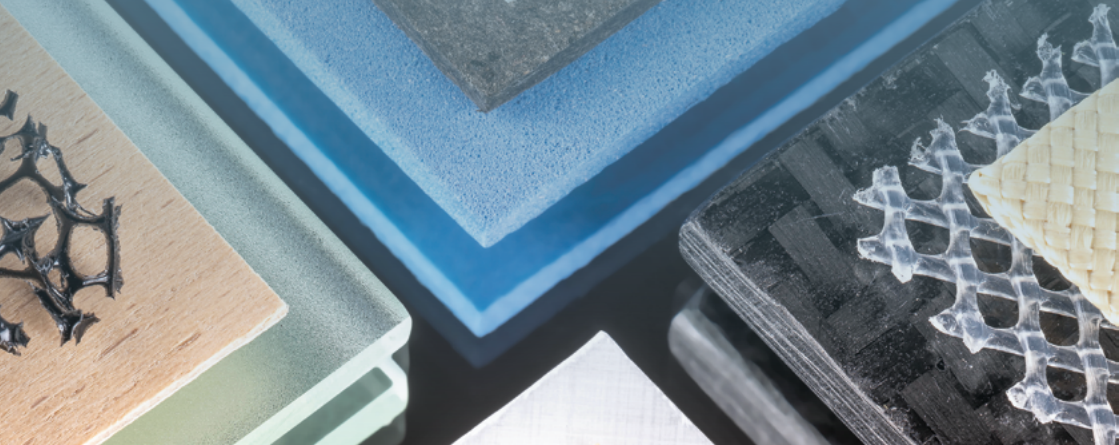


# CONFERENCE GUIDE

**27<sup>th</sup> DYMAT Technical Meeting 2023**

Dynamic behaviour  
of soft and low density materials

27<sup>th</sup>-29<sup>th</sup> November 2023 – L'Espace Auguste, Colmar, France



It is a great pleasure and honour to welcome you here, in a festive Colmar, to discuss challenging issues related to soft and low-density materials. We hope that this scientific event will raise questions, stimulate exchanges and generate new ideas.

We also hope you will take the opportunity to explore the city, which is particularly picturesque at this time of the year. Enjoy the fairytale setting of its Christmas markets with other participants and perhaps the cosy, magical atmosphere will inspire new collaborations and projects! As a novelty this year, we are very pleased to announce that a prize will be awarded for the best student oral presentation. Participants have also been given the opportunity to have their paper published in a special issue of *Material Letters*.

We would like to thank our sponsors for their support and encourage you to visit their stands for an update on their latest products and activities. Another big thank you to our organising committee for putting this Meeting together and for all the hard work that went into it.

Have a very enjoyable and fruitful 27<sup>th</sup> DYMAT Technical Meeting!

**Yaël DEMARTY**



# PROGRAMME

## Sunday 26<sup>th</sup> of November

18:00 - 19:30 **Welcome Cocktail** - *Hotel Mercure*



## Monday 27<sup>th</sup> of November

*Espace Auguste*

**08:00** Registration - *Espace Tonnelier*

**08:45** Welcoming talks, Chairperson: Y. Demarty - *Auditorium*  
ISL Directors, DYMAT President, Organiser

**Session 1: Fluids and Gels**, Chairpersons: E. Cadoni, F. Galvez - *Auditorium*

**09:30** *[Keynote]* Shock attenuation characteristics of methylcellulose hydrogels: Experimentation and phenomenological modeling  
D. Rittel

**09:50** Machine learning-enhanced finite element method to account for fluid-structure interaction effects on shock-like loaded plates  
L. Lomazzi, D. Morin, F. Cadini, A. Manes, V. Aune

**10:10** Advancements in numerical modelling of synthetic gel for ballistic impact assessment  
M. Chaufer, R. Delille, B. Bourel, C. Marechal, F. Lauro, O. Mauzac, S. Roth

**10:30** **Presentation** - *Auditorium*  
Exhibitors

**10:50** **Coffee break** - *Espace Tonnelier*

**Session 2: Polymers**, Chairpersons: R. Matadi Boumbimba, S. Walley - *Auditorium*

**11:20** *[Keynote]* Modelling the high rate and shock response of polymers from a molecular basis  
P.J. Gould

**11:40** Dynamic behavior of multilayered skin structure: A preliminary numerical and analytical microscopic analysis  
J. Shen, S. Meng, T. Hirschler, S. Roth

**12:00** Pressure and rate sensitivity of elastic properties in polymethylmethacrylate (PMMA)  
J. Jordan

**12:20** Experimental characterization of a polydichloropentadiene thermoset, study of protective metal-polymer and polymer-metal two-layer structures  
M. Robin, M. Adlafi, B. Galpin, V. Grolleau, L. Mahéo

**12:40** **Lunch** - *Espace Tonnelier*

**Session 3: Experimental techniques**, Chairpersons: V. Grolleau, P. Verleysen - *Auditorium*

**14:00** Understanding the dynamic response of soft materials in the ultrasonic range using the IBUS test  
A. Marek, F. Pierron

**14:20** X-ray diffraction of high density polyethylene under dynamic compression  
R.C. Huber, E.B. Watkins, D.M. Dattelbaum, L.L. Gibson, B.D. Bartram, R.L. Gustavsen, J.L. Jordan

- 14:40** In-situ SEM micropillar compression and nanoindentation testing of SU-8 polymer up to 1,000 s<sup>-1</sup> strain rate  
R. Cherukuri, A. Lambai, L. Sukki, J. Väliaho, P. Kallio, E. Sarlin, R. Ramachandramoorthy, M. Kanerva, G. Mohanty
- 15:00** A Direct Impact Tension Bar setup for testing low-impedance materials at intermediate rates of strain  
P. Jakkula, G. Ganzenmüller, S. Hiermaier
- 15:20** Flash X-ray radiography of internal damage in soft cellular materials during instrumented dynamic penetration  
T. Fíla, J. Falta, P. Koudelka, J. Šleichrt, N. Krčmářová, I. Duarte
- 15:40** **Coffee break** - *Espace Tonnelier*
- Session 4: Cellular materials**, Chairpersons: B. Erice, G. Ganzenmüller - *Auditorium*
- 16:10** Shock compression of a low-density carbon foam  
D.M. Dattelbaum, B.C. Macnider, R.C. Huber, J.M. Lang
- 16:30** On the dynamic performance of additively manufactured visco-elastic meta-materials  
L. Le Barbenchon, M. Lišner
- 16:50** Strain rate effect on the compressive behaviour of a thick cellular structural adhesive  
M. Wetta, J.-B.Kopp, L. Le Barbenchon, P. Viot
- 17:10** Finite element modelling of cellular architectures subjected to dynamic events  
K. Krishnan, J. Oyebanji, D.-W. Lee, H. Ramos, A. Aziz, N. Kakur, R. Santiago
- 17:30 - 18:45** **General Assembly** - *Auditorium*  
DYMAT President and Governing Board
- 18:45** Enjoy your free time : Have a taste of our gastronomy at the Gourmet Market

## Tuesday 28<sup>th</sup> of November

*Espace Auguste*

**Session 5: Fabrics and Composites**, Chairpersons: J. Jordan, L. Peroni - *Auditorium*

- 09:00** *[Keynote]* Dynamic mechanical testing of yarns and fabrics  
H. Wang, P.J. Hazell
- 09:20** Towards an efficient multi-scale numerical model of the impact behavior of woven materials with Global/Local approach  
T.L. Chu, C. Ha-Minh, A. Imad, Q.H. Pham
- 09:40** Impact-dynamic properties of aromatic hyperbranched polyester/RTM6 epoxy nanocomposites  
A. Elmahdy, N. Ghavanini, A. Zotti, M. Zarrelli, A. Borriello, P. Verleysen
- 10:00** Effect of fixture boundary conditions for low-velocity impact: A focus on composites with different matrix and fibers  
D. Ma, M. Rezasefat, J. Aparecido da Cruz, S. Amico, M. Giglio, A. Manes
- 10:20** Efficient method to predict the strain rate sensitivity of an UHMWPE thin ply composites  
T. Poulet, A. Bracq, Y. Demarty, R. Delille, F. Lauro, N. Bahlouli
- 10:40** **Coffee break** - *Espace Tonnelier*

**Session 6: Composites and laser shocks**, Chairpersons: A. Cosculluela, M. Scapin - *Auditorium*

- 11:10** High speed infrared thermography for in-situ damage detection during impact tests on CFRP  
J. Berthe, R. Mouton, G. Portemont, A. Péroche, T. Fourest
- 11:30** Laser-induced shockwaves for damage assessment and shockwave propagation characterization in the fiber direction of unidirectional composites  
M. Casapu, A.C. Casapu, M. Arrigoni, I. Fuiorea
- 11:50** Sensitivity study of the pressure load parameters of laser shock on CFRP and its influence on the back-face velocity signal  
B. Better, M. Arrigoni, A.E.M. Alaoui, S. Guetta, M. Boustie, D. Zagouri, C. Jochum, G. Le Morvan, C. Espinosa, F. Lachaud
- 12:10** Dynamic behavior of porous graphite under laser-induced shocks  
A. Morena, L. Peroni, M. Scapin
- 12:30** **Lunch - Espace Tonnelier**

**Session 7: Bio-based materials**, Chairpersons: P. Viot, L. Mahéo - *Auditorium*

- 14:00** *[Keynote]* Dynamic behavior of bio-based fibers and composites materials  
N. Bahlouli, M. Lefèbvre, D. Notta-Cuvier, Y. Demarty, F. Lauro
- 14:20** An exploratory investigation of novel composites based on cork and non-Newtonian fluids under low-velocity impact  
G.J.A. Sousa, G.F. Serra, L. Oliveira, R.J. Alves de Sousa, F.A.O. Fernandes
- 14:40** On the development of a high strain-rate tensile testing method for thin low-impedance materials  
G. Baumann, C. Czibula, U. Hirn, F. Feist
- 15:00** Effect of dynamic loading on the brittle behavior of biomaterial microstructure - Response of nutshell under dynamic compression  
P. Viot
- 15:20** Influence of the loading regime on the uniaxial compressive behaviour of density graded Citrus Maxima peel  
L. Le Barbenchon
- 15:40** **Coffee break - Espace Tonnelier**

**Session 8: Structures and metallic materials**, Chairpersons: M. Hokka, F. Pierron - *Auditorium*

- 16:10** Investigating interfaces in dynamic environments – A new approach  
M. Lišner, N. Petrinic, B. Erice
- 16:30** Dynamic behaviour of additive manufactured Ti6Al4V BCC lattice-based structures  
A. Cardeña, R. Sancho, D. Barba, F. Gálvez
- 16:50** On the ballistic perforation resistance of a sandwich structure with aluminium skins and aluminium foam core  
K.A. Brekken, M.S. Bakk, S. Dey, T. Berstad, A. Reyes, T. Børvik
- 17:10** Experimental investigation of 3D printed infill structures for crash absorbing applications  
F. Bandinelli, L. Peroni, M. Scapin
- 17:30** Visit the Colmar's Six Christmas Markets in the historic town
- 19:00** **Gala Dinner**  
*Salle de la Piscine, Musée Unterlinden*



# Wednesday 29<sup>th</sup> of November

*Espace Auguste*

**Session 9: Sustainable materials and new composites**, Chairpersons: P. Hazell, N. Bahlouli - *Auditorium*

**09:00** *[Keynote]* From bio-sourced to bio-inspired cellular materials: A review on their mechanical behavior under dynamic loadings  
L. Le Barbenchon, P. Viot

**09:20** Low-velocity impact performance of integrally-3D printed continuous carbon fibre composite sandwich panels

I. Sukia, U. Morales, A. Esnaola, B. Erice, J. Aurrekoetxea

**09:40** Impact behavior of sustainable sandwich composites

S. Achar, Z. Szkudlarek, K.R. Ramakrishnan

**10:00** Experimental and multiscale investigation of the elastic and impact properties of glass fibers/Elium acrylic modified nanoparticles, laminate composites

A.Y.E. Kouassi, N. Koumba, P. Gerard, R. Matadi Boumbimba, M.K. Sangaré

**10:20** **Coffee break** - *Espace Tonnelier*

**Session 10: Industrial applications**, Chairpersons: E. Buzaud, M. Langseth - *Auditorium*

**10:50** Advanced characterisation of photovoltaics for hail resistance

E. Cadoni, D. Forni, M. Dotta, G. Bellenda, M. Caccivio

**11:10** Investigation on the impact of H<sub>2</sub>, D<sub>2</sub> and N<sub>2</sub> cryogenic solid ice pellets

J. Berton, F. Souris, J. Manzagol, T. Boujet, F. Millet, E. Studer, B. Cariteau, P. Forquin

**11:30** Nonlinear viscosity and its emergent effect: A theoretical and experimental discussion

M. de Lorenzo Oliveira, P. Le Tallec, P. Bussetta, E. Berger, S. Nuytten

**11:50** **Announcements** - *Auditorium*

DYMAT GB

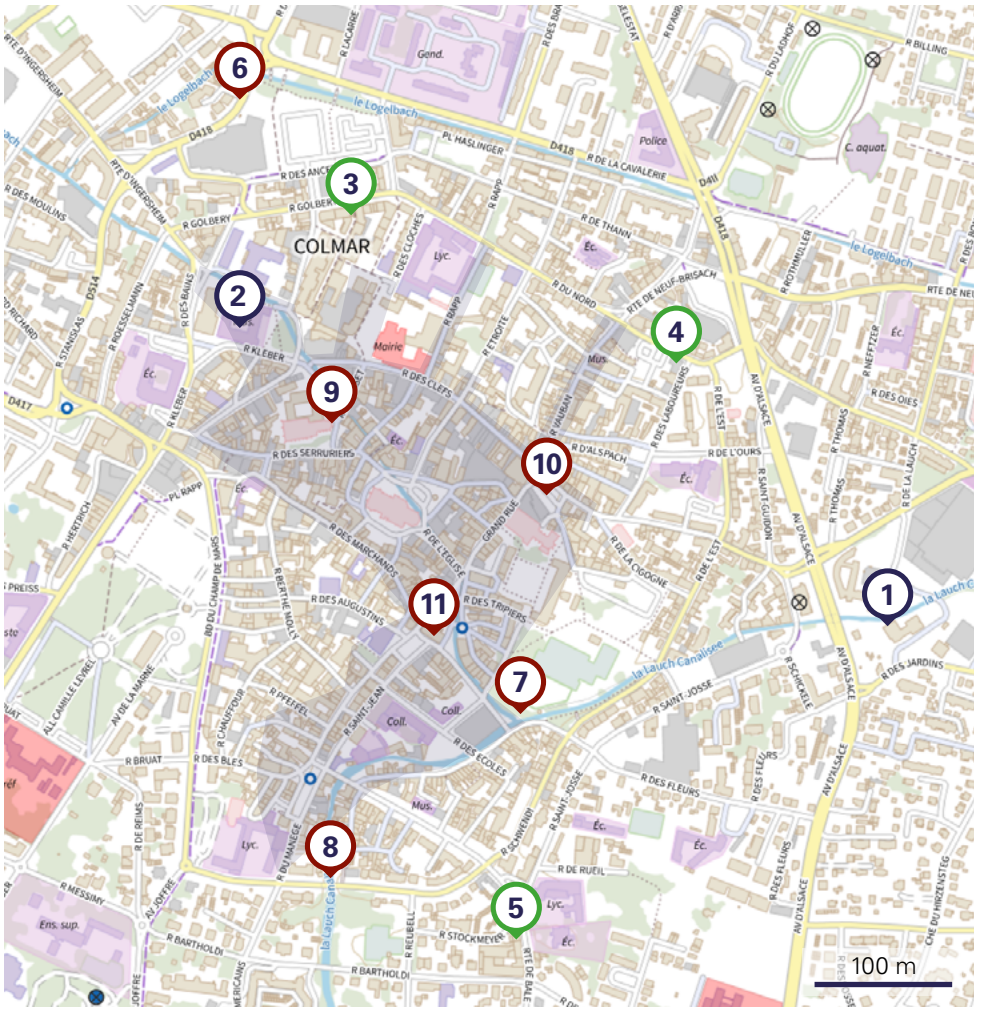
**12:10** **Lunch** - *Espace Tonnelier*

**13:10** Transfer to ISL (for validated visitors)

**14:00** Lab tour (for validated visitors)

**17:00** **End of the conference**





- ① Espace Auguste (Conference location) ..... 5 Rue des Jardins
- ② Musée Unterlinden (Gala dinner) ..... Pl. des Unterlinden
- ③ Hôtel Mercure (Welcome cocktail) ..... 15 Rue Golbéry
- ④ Hôtel IBIS ..... 10 Rue Saint-Eloi
- ⑤ Hôtel Turenne ..... 10 Route de Bâle
- ⑥ Christmas shuttles station ..... Rue de la 5ème D.B
- ⑦ Ferris wheel and Gourmet Market ..... Rue de la Montagne Verte
- ⑧ Boat departure and Petite Venise ..... Boulevard St Pierre
- ⑨ Place des Dominicains ..... Pl. des Dominicains
- ⑩ Place Jeanne d'Arc ..... Pl. Jeanne d'Arc
- ⑪ Place de l'Ancienne Douane ..... Pl. de l'Ancienne Douane

■ Pedestrian area

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