



## Program

# The 8<sup>th</sup> International Conference on Structural Analysis of Advanced Materials

August 28-31, 2018

*National Engineering School of Tarbes, France*

The 8th International Conference on Structural Analysis of Advanced Materials - Ecole Nationale d'Ingénieurs de Tarbes, France - August 28-31, 2018

Tuesday 28 <sup>th</sup> Aug.		Wednesday 29 <sup>th</sup> Aug.			Thursday 30 <sup>th</sup> Aug.			Friday 31 <sup>th</sup> Aug.	
9h00	9h20				Plenary Lecture 3 - D. Kondo (5)			Plenary Lecture 5 - J.N. Périé (6)	
9h20	9h40				Plenary Lecture 4 - R. Boman (4)			Plenary Lecture 6 - D. Shah (1)	
9h40	10h00				Refreshment Break			Refreshment Break	
10h00	10h20				M. Grégoire	A. Patrascu	R. Desmorat	P. Evon	C. Li
10h20	10h40				E. Zidaru	S. Rangasamy		W. Han	B. Chaibedra
10h40	11h00				P. Ouagne	B. Saadouki	W. Xiang	L. Bailly	F. Frigui
11h00	11h20	<b>11 h - Reception &amp; registration</b>			M. Salem	M. Dawoua	A. Mattiello	B. Niang	S. Bakrani
11h20	11h40								F. Zaoui
11h40	12h00				LUNCH BREAK			LUNCH BREAK	
12h00	14h00	LUNCH BREAK			LUNCH BREAK			LUNCH BREAK	
14h00	14h20	<b>Opening</b>			Poster session			V. Placet	L. Amamra
14h20	14h40	Plenary Lecture 1 - A. Bourmaud (1)						C. Li	M. Thévenot
14h40	15h00								M. Doumeng
15h00	15h20	Plenary Lecture 2 - F. Martina (3)			J. Beaugrand	L. Cadieu	J. Huang	Laboratory visit and demonstration - LGP -	
15h20	15h40					M. Widjaja	O. Pantalé		
15h40	16h00	Refreshment Break			Refreshment Break				
16h00	16h20	S. Amaducci	M. Villar		L. Labonne	T. Birro	H. Belhouchet	Refreshment Break	
16h20	16h40		A. Faye			O. Tramis	H. Dehmous		
16h40	17h00	J. Mussig	J.D. Beguin		Valorisation of bio based resources : equipments demonstration			17h-18h - Aerospace Valley Meeting members	
17h00	17h20								aerospace valley
19h00 Town Hall cocktail city of Tarbes			19h30 - Visit of the Haras of Tarbes 20h30 - Conference Dinner at Tarbes' Haras						

- session 1/2 Characterization, extraction and manufacturing processes of initial components of structural fibrous materials
- session 3 Manufacturing and assembly by special processes
- session 4 Process simulation
- session 5 Behaviour of heterogeneous materials and structures - Damage
- session 6 Experimental developments

9h00 - 16h30  
Social event  
Visit of the castle  
of PAU

## Scientific Committee

ALEXIS Joël, National Engineering School Tarbes, France  
BEAUGRAND Johnny, INRA Nantes, France  
BOMAN Romain, University of Liège, Belgium  
BOURMAUD Alain, University Bretagne Sud, France  
DALVERNY Olivier, National Engineering School Tarbes, France  
D'AMORE Alberto, The Second University of Naples-SUN, Italy  
DAS Raj, RMIT University, Melbourne, Australia  
De LUYCKER Emmanuel, National Engineering School Tarbes, France  
EVON Philippe, INP-Toulouse, France  
FAZZINI Marina, National Engineering School Tarbes, France  
GARNIER Christian, National Engineering School Tarbes, France  
JIGA Gabriel, University "Politehnica" of Bucharest, Romania  
MÜSSIG Jörg, Hochschule Bremen, Germany  
KONDO Djimedo, UPMC Paris 6, France  
MARTINA Filomeno, Cranfield University, United Kingdom  
MOREIRA Pedro, INEGI, Portugal  
OUAGNE Pierre, National Engineering School Tarbes, France  
PANTALE Olivier, National Engineering School Tarbes, France  
PAPANICOLAOU George, University of Patras, Greece  
PERIE Jean-Noël, UPS Toulouse, France  
PLACET Vincent, University Franche Comté, France  
SHAH Darshil, University Cambridge, United Kingdom  
WELEMANE Hélène, National Engineering School Tarbes, France

## Organizing Committee

### Co-Chairmen of ICSAAM 2018:

DALVERNY Olivier  
OUAGNE Pierre

### Committee members:

ARNAUD Lionel  
BAILI Maher  
DE LUYCKER Emmanuel  
FAYE Jean-Pierre  
FAZZINI Marina  
GARNIER Christian  
MARTIN Carmen  
PANTALE Olivier  
TONGNE Amèvi  
WELEMANE Hélène

### Tuesday 28th Aug.

14h00	14h20	<b>Opening session: Pr. P. OUAGNE and Pr. O. DALVERNY</b>	(room, Grand amphithéâtre)
		<b>Plenary lectures : Chair Pr. P. OUAGNE and Pr. J. ALEXIS</b>	
14h20	15h00	<b>A. Bourmaud</b> , Towards the design of high-performance plant fibre composites: how can we best define the diversity and specificities of plant cell walls?	
15h00	15h40	<b>F. Martina</b> , J. Ding, P.A. Colegrove, S. Ganguly, G. Pardal, S.W. Williams, State of the art of Wire+Arc Additive Manufacturing	
		<b>Topic A: Fibre, polymers and composites for materials applications</b>	(room, Amphi B)
		<b>Characterization, extraction and manufacturing processes of initial components of structural fibrous materials - Chairman: Pr. P. OUAGNE</b>	
16h00	16h40	S. Amaducci, Controlling hemp ( <i>Cannabis sativa L.</i> ) fibre quality in the field: state-of-the-art and perspectives	
16h40	17h20	Jorg Mussig, Characterisation of the decortication behaviour of hemp stems ( <i>Cannabis sativa L.</i> )	
		<b>Topic B: Welding and joining of advanced materials</b>	(room, Grand amphithéâtre)
		<b>Manufacturing and assembly by special processes - Chairman: Dr. F. MARTINA</b>	
16h00	16h20	M. Villar, C. Garnier, F. Chabert and V. Nassiet, Modifying driven wedge test for mechanical characterization of PEKK interfaces assembled by through transmission laser welding technology	
16h20	16h40	A. Faye, Y. Balcaen, M. Fazzini, J.-D. Beguin and J. Alexis, Weldability of aluminium alloy AA6061 by Yb: YAG	
16h40	17h00	J.-D. Béguin, Y. Balcaen, J. Alexis and E. Andrieu, Relationship between Yb: YAG disk laser welding parameters, weld bead morphology and microstructure of commercially pure titanium	

**Wednesday 29th Aug.**

<b>Plenary lecture. Chair: Dr. H. WELEMANE and Pr. O. PANTALE</b> (room, Grand amphithéâtre)			
9h00	9h40	C. Bouby and <u>D. Kondo</u> , A unified thermodynamics framework for plasticity models of ductile porous materials	
9h40	10h20	<u>R. Boman</u> , L. Papeleux and J.-P. Ponthot, Effective development of a finite-element solver at the University	
10h20	10h40	Break	
		<b>Topic A: Fibre, polymers and composites for materials applications</b>	(room C)
		Characterization, extraction and manufacturing processes of initial components of structural fibrous materials –	
		Chairman: <b>Pr. J. MÜSSIG</b>	
10h40	11h00	M. Grégoire, P. Ouagne, L. Labonne and P. Evon, Minimisation of the hemp fibre extraction impact using scutching or "all fibre" devices	
11h00	11h40	P. Ouagne, M. Grégoire, B. Barthod-Malat, L. Labonne V. Placet and P. Evon, Vegetal fraction extraction and potential of valorisation of linseed flax stems	
11h40	12h00	M.M. Salem, E. De Luycker, M. Fazzini and P. Ouagne, Study of the tow buckling and tow sliding defects during the complex shape forming of synthetic and vegetal fibre reinforced structural composites	
		<b>Topic B: Welding and joining of advanced materials</b>	(room, Amphi B)
		Process simulation - Chairman: <b>Dr. R. BOMAN</b>	
10h40	11h00	A.I. Patrascu, N.L. Zaharia, E.G. Zidaru, A. Hadar, G. Jiga and C. Petre Virtual model calibration of a railway vehicle body	
11h00	11h20	E.G. Zidaru, A. Hadar, G. Jiga, N.L. Zaharia, A. Patrascu, C. Petre, Numerical analysis on railway vehicles body	
11h20	11h40	B. Saadouki, Fatigue damage in fieldshapers used during electromagnetic forming and welding processes at high frequency impulse current	
11h40	12h00	M. Dawoua Kaoutoing, R. Houé Ngouna, T. Béda and O. Pantalé, An Analytical Model of Orthogonal Metal Cutting: Implementation using LMFIT Library in Python	
		<b>Topic C: Experimental techniques and damage of materials and structures</b>	(room, Grand amphithéâtre)
		Behaviour of heterogeneous materials and structures - Damage - Chairman: <b>Pr. D. KONDO</b>	
10h40	11h00	R. Desmorat, B. Desmorat, M. Olive and B. Kolev, Micromechanics based framework for second order damage	
11h00	11h20	S.R. Rangasamy Mahendren, H. Welemane, O. Dalverny and A. Tongne, Modelling and simulation of brittle damage in ceramic assemblies	
11h20	11h40	W. Xiang, F. Gazes, J. Liu, A. Hocini and G. Dirras, A 3D crystal plasticity modelling of cyclic deformation for a commercial purity polycrystalline Ti with harmonic structure	
11h40	12h00	A. Mattiello, R. Desmorat and J. Cormier, Rate dependent damage of single crystal superalloys	
12h00	14h00	LUNCH	
14h00	15h00	<b>Poster session</b>	
		<ol style="list-style-type: none"> <li>1. S. Amroune, A. Belaadi, M. Bouchrek, B. Mohamad and I. Beddiar, Effect of alkaline treatments and volume fractions on the mechanical and physicochemical properties of HDPE/SPDF green composites.</li> <li>2. Robillard, E. Uitterhaegen, O. Merah, S. Ballas, T. Véronèse, T. Talou, P. Evon and V. Simon, Building materials. A comparative study of VOC emission rates involving commercial glued wood panels and fiberboards resulting from a coriander biorefinery.</li> <li>3. E. Uitterhaegen, O. Merah, T. Talou, S. Ballas, T. Véronèse and P. Evon, Production and characterization of novel renewable fiberboards resulting from a coriander biorefinery.</li> <li>4. E. Uitterhaegen, L. Labonne, S. Ballas, T. Véronèse and P. Evon, The coriander straw, an original agricultural residue for 100% bio-based building materials.</li> <li>5. F. Khalfallah, Z. Boumerzoug, S. Rajakumar and E.H. Raouache, Effect of friction time on mechanical and microstructure properties of Aluminum – Ceramic dissimilar joints.</li> <li>6. E.H. Raouache, F. Khalfallah and S. Rajakumar, Numerical simulation on joining of ceramics with Aluminum dissimilar joints by friction welding.</li> <li>7. V. Manescu (Paltanea), G. Paltanea, D. Popovici and G. Jiga, Degradation of magnetic properties of non- oriented silicon iron strips due to the cutting procedure.</li> <li>8. Y. Bresson and L. Arnaud, Alternative powder use validation in additive manufacturing selective laser melting Process.</li> <li>9. M. Mejri, Reliability study of a T-bonded structure with nonlinear behaviour.</li> <li>10. A.A. Redhwane, M. Noureddine and A.A. Hassen, Analysis of wave propagation and vibratory behavior of FGM plates.</li> <li>11. O. Dalverny, J.-P. Faye, C. Martin, H. Welemane, POCRISC: toward a common culture of seismic risk in the Pyrenees.</li> <li>12. S. A. Negru, Structural analysis of a drone.</li> </ol>	

<b>Topic A: Fibre, polymers and composites for materials applications</b>			
Characterization, extraction and manufacturing processes of initial components of structural fibrous materials –			(room C)
Chairman: Dr. V. PLACET			
15h00	15h40	J. Beaugrand. Small scale breakage mechanisms of hemp fibers and NFC microstructure investigation by confocal Raman Imaging	
15h40	16h00	Break	
16h00	16h20	L. Labonne, G. Chino and P. Evon, Influence of thermo-pressing conditions on the mechanical properties of fiberboards made from coconut fibers	
<b>Topic B: Experimental techniques and damage of materials and structures</b>			
Behaviour of heterogeneous materials and structures - Damage - Chairman: Dr. C. GARNIER			(room, Grand amphithéâtre)
15h00	15h20	L. Cadieu, J.-B. Kopp, J. Jumel, J. Bega and C. Froustey, Kinetic effects on the mechanical properties of a fibre reinforced thermoplastic laminate under indentation and impact loadings	
15h20	15h40	M.P. Widjaja, S. Joannès, A. Bunsell, G. Mair and A. Thionnet, Defining a Reduced Volume Zone for the Simulation of Burst Test on a Composite Pressure Vessels	
15h40	16h00	Break	
Behaviour of heterogeneous materials and structures - Damage - Chairman: Dr. H. WELEMANE			
16h00	16h20	T. Birro, E. Paroissien, M. Aufray and F. Lachaud, Prediction of adhesion failure of bonded joints using 3-point bending test and stressenergy coupled criterion	
16h20	16h40	O. Tramis, C. Garnier, F. Chabert and V. Nassiet, Effect of fatigue loading in mechanical and physical-chemical properties of recycled PET/PP blends	
<b>Topic C: Experimental techniques and damage of materials and structures</b>			
Experimental developments - Chairman: Dr. J.-N. PERIE			(room, Amphi B)
15h00	15h20	J. Huang, C. Garnier, M.L. Pastor and X. Gong, Rapid evaluation of fatigue life in cross-ply CFRP laminates based on fracture fatigue entropy	
15h20	15h40	O. Pantalé and L. Ming, A new Taylor tensile impact test for the identification of dynamic material behavior law	
15h40	16h00	Break	
Experimental developments - Chairman: Dr. M. FAZZINI			
16h00	16h20	H. Belhouchet, M. Hamidouche and G. Fantozzi, Mechanical behaviour of dense mullite-zirconia composites prepared from zircon and boehmite	
16h20	16h40	H. Dehmous, H. Welemane, F. Bouguera and D. Amouri, Experimental analysis of short confined columns	
16h40	17h00	L. Micipsa and M. Bachir, Sustainability of Marnes Treated with Lime	

## Thursday 30th Aug.

Plenary lecture : Chair: Pr. O. DALVERNY and Pr. P. OUAGNE (room, Grand amphithéâtre)			
9h00	9h40	J.N. Périé, J.-C. Passieux, FE DIC for strengthening the experiment/simulation dialog: application to composites	
9h40	10h20	D. Shah, The design of a structural biocomposite	
10h20	10h40	Break	
Topic A: Fibre, polymers and composites for materials applications (room C)			
Characterization, extraction and manufacturing processes of initial components of structural fibrous materials – Chairman: Dr. J. BEAUGRAND			
10h40	11h20	P. Evon and E. Uitterhaegen. Renewable binderless boards molded using vegetable proteins and lignocellulosic fibers: case studies of sunflower and coriander	
11h20	11h40	L. Bailly, B. Hassoune-Rhabour, A. Abadie, B. Boniface and V. Nassiet, Study of the difference of behaviour between two cyanate ester resins at their initial state and after thermal ageing	
11h40	12h00	B. Niang, D. Ndiaye and E.H.B. Ly Gamma-radiation-induced HDPE/Wood Composite: Studies of Morphological, Mechanical and Thermal Properties of the Composites	
Topic B: Welding and joining of advanced materials (room, amphi B)			
Process simulation - Chairman: Pr. O. PANTALE			
10h40	11h00	C. Li, A. Cantarel and X. Gong, Numerical simulation of resin infiltration process on 3D complex fibrous model at meso-scale	
11h00	11h20	W. Han, F. Berthet, G. Dusserre and F. Schmidt, Modelling the shape of an adhesive joint during assembly	
11h20	11h40	S. Bakrani Balani, F. Chabert, A. Cantarel and V. Nassiet, Numerical simulations accounting for crystallization in Fused Filament Fabrication process of PEEK	
11h40	12h00	M. Nasri, C. Garnier, F. Abbassi, A. Labanieh, O. Dalverny and A. Zghal, Sensitivity analysis of composite forming process parameters using numerical hybrid discrete approach	
Topic C: Experimental techniques and damage of materials and structures (room, Grand amphithéâtre)			
Experimental developments - Chairman: Dr. C. MARTIN			
10h40	11h00	B. Chaibedra, A. Benanane, S.M. Bourdim, A. Ouazir, S. Bahar, M. Salah and A. Belbachir, Pushover method to seismic vulnerability assessment of buildings at Mostaganem city in Algeria	
11h00	11h20	F. Frigui J.-P. Faye, C. Martin, O. Dalverny, F. Peres and S. Judenherc, Operational modal analysis using asynchronous data for frequencies and mode shapes identification	
11h20	11h40	F.Z. Zaoui, A. Tounsi and D. Ouinas, Dynamic behavior of advanced composites plates on elastic foundation	
11h40	12h00		
12h00	14h00	LUNCH	
Topic A: Fibre, polymers and composites for materials applications (room C)			
Characterization, extraction and manufacturing processes of initial components of structural fibrous materials – Chairman: Pr. P. OUAGNE			
14h00	14h40	A. Del Masto, F. Trivaudey, V. Guicheret-Retel, V. Placet, A multiscale model-based investigation of the nonlinear tensile behaviour of plant fibre composites	
Topic B: Welding and joining of advanced materials (room, amphi B)			
Process simulation - Chairman: Dr. A. TONGNE			
14h00	14h20	L. Amamra, S. Benanane, A. Benanane, S.M. Bourdim, A. Ouazir, B. Chaibedra and Z. Bouzadi, Application of genetics concepts to the reinforced concrete cantilever beam	
14h20	14h40	C. Li, A. Cantarel and X. Gong, A Two Phases Coupling Free and Porous Method at Meso Scales of LCM Process Flow	
Topic C: Experimental techniques and damage of materials and structures (room, Grand amphithéâtre)			
Experimental developments - Chairman: Dr. J.-N. PERIE			
14h00	14h20	M. Thévenot, V. Wagner, J.-Y. Paris, G. Dessein, J. Denape, M. Harzallah, A. Brunet and T. Chantrait, Tribological interpretation of abradable coating behavior during high speed contact	
14h20	14h40	M. Doumeng, F. Ferry, K. Delbé, T. Mérian, F. Chabert, F. Berthet, O. Marsan, V. Nassiet and J. Denape, Evolution of Crystallinity Under Tribological Constraints in Peek and Peek Charged with Glass Fibers	
17h00	18h00	Aerospace Valley meeting members	(room, amphi B)

## Tuesday 28<sup>th</sup> – 7 PM – Cocktail at town hall city of Tarbes

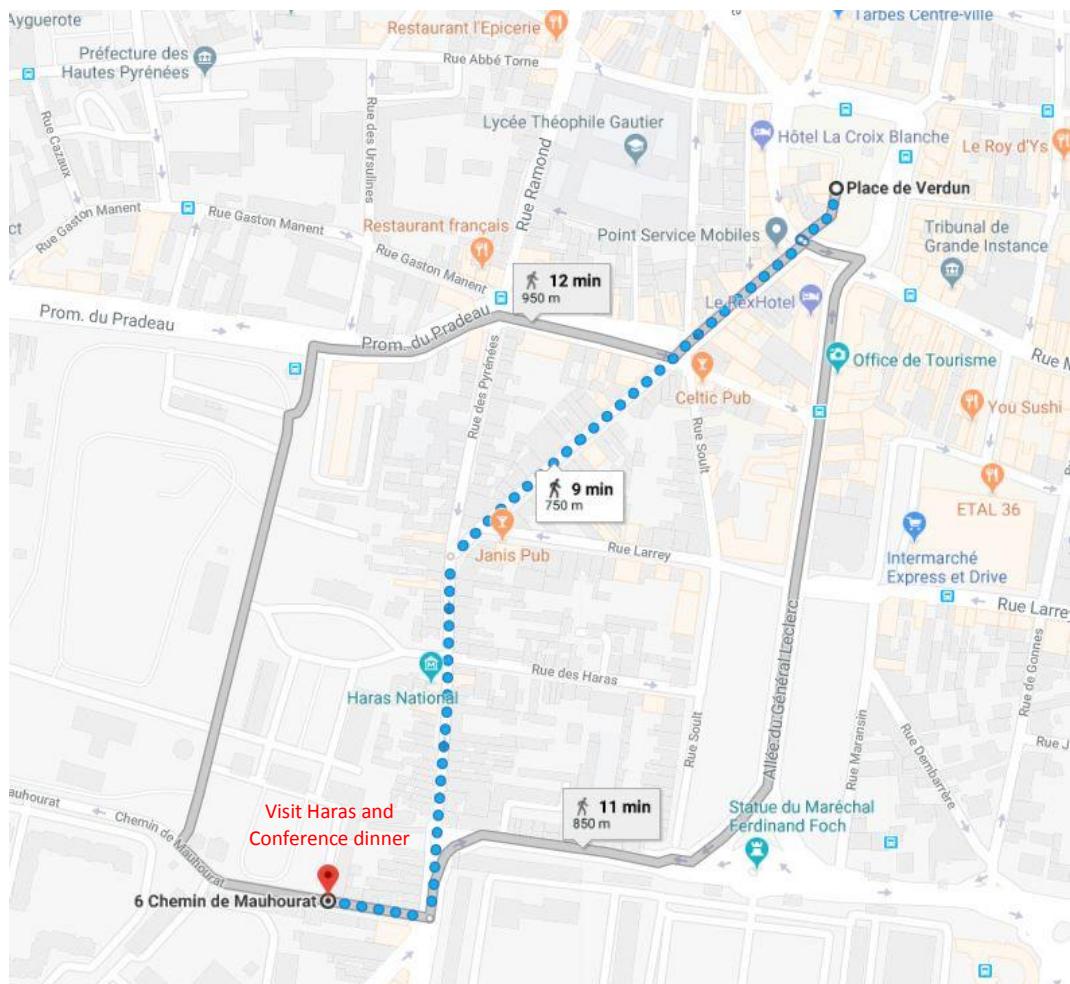
Place Jean Jaurès (about 5 mn walk from Place Verdun)



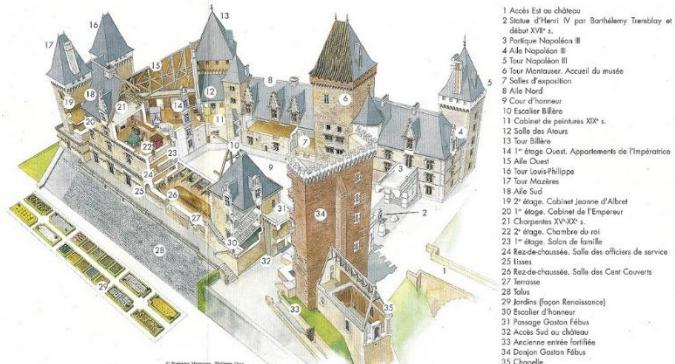
## Wednesday 29<sup>th</sup> – Haras of Tarbes

7:30 PM – Visit and 20:30 PM – Conference Dinner

6 chemin de Mauhourat (about 10 mn walk from Place Verdun)



**Friday 30<sup>th</sup> – Social event « Visit of the castle of Pau »  
Departure from ENIT at 9 AM**



## ENIT Access plan

