

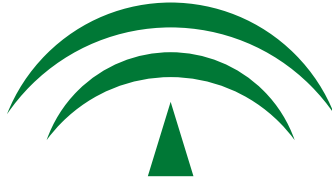


# 8<sup>th</sup> EATA Conference 2019

Final Program

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**8<sup>th</sup> BEATA  
Conference  
2019**

# WELCOME

Welcome to the 8th EATA 2019 Conference, hosted for the first time in Spain from 3<sup>rd</sup> to 5<sup>th</sup> June by the Laboratory of Construction Engineering of the University of Granada (LabIC.UGR). The University of Granada was founded in 1531 and has been built on a long-standing and cumulative teaching culture, dating back all the way to the Madrasahs of the Nasrid dynasty of Granada in 1349. At present, it is the 3<sup>rd</sup> highest-ranked in Spain, according to the Shanghai Academic Ranking of World Universities. LabIC.UGR is a research group that has a wide range of experience in the study and development of materials and technologies for transportation infrastructures (roads, railways, ports and airports), where asphalt materials is one of the principal topics covered in their research projects.



The 8<sup>th</sup> EATA Conference will bring together academia, industry and public organisms, providing a unique opportunity for engineers and researchers to share their work and to learn about the most advanced development in asphalt technologies. A total of 32 from

more than 120 papers submitted were selected through a rigorous peer-review process and will be presented during the conference's sessions. The key topics the conference will explore are: sustainability and circular economy (reuse of wastes, warm mix asphalt, crumb rubber, urban heat island mitigation), future trends in asphalt pavements (electrified road systems, solar roads, asphalt healing, sensed roads, etc.), advanced tests, materials and methods (additives, binders, mortars and mixtures), long term performance (ageing, moisture, rejuvenators, etc.), aggregates and mineral skeleton (stone-on-stone- design, locking point compaction energy and adhesiveness among others) and asphalt materials mechanics (numerical simulation, precision modal analysis, probabilistic prediction, etc.).

As chairs of 8<sup>th</sup> EATA Conference, we would like to thank all the authors and peer-reviewers, who contributed significantly to carry out this event. We would like to give a special thanks to the LabIC. UGR Research Group, the Local Organizing Committee, for their motivation, dedication and the great work they have done (all of them will be available during the conference, so please do not hesitate to contact them if you need any help or advice). We would also like to express our sincere gratitude to all the supporters and sponsors. All of them made a great contribution in order for this conference to be a success. Finally, we would like to acknowledge Prof. Hervé Di Benedetto for his commitment to making the EATA conference a success one more time. It has been an honor and pleasure to journey along this road with him.

We hope all of you can enjoy the conference as well as the opportunities that Granada, and its surrounding areas, can offer.



**Prof. Mª Carmen Rubio-Gómez & Prof. Fernando Moreno-Navarro**

Chairs of EATA 2019



## EATA 2019 COMMITTEES

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LabIC.UGR, Universidad de Granada, Spain

**Fernando Moreno-Navarro (Chair)**

LabIC.UGR, Universidad de Granada, Spain

**Hervé Di Benedetto (Co-Chair)**

Université de Lyon/ENTPE, France



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**Raúl Tauste Martínez**



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**8<sup>th</sup> BEATA  
Conference  
2019**

Granada, 3 - 5 June 2019



# VENUE

EATA 2019 will be held at E.T.S. Ingenieros de Caminos, Canales y Puertos (Faculty of Civil Engineering) of the University of Granada.

Address: Avda. Severo Ochoa, s/n, 18071, Granada (Spain)

Web: <https://etsiccp.ugr.es/>

Google Maps Location: <https://goo.gl/maps/UnAV72NVSQnRNJWc8>



# PROGRAM

	Sunday 2nd June "Welcome day"	Monday 3rd June "Sustainability and Circular Economy"	Tuesday 4th June "Emerging Materials and Technologies"	Wednesday 5th June "Durability and Long term Performance"	Thursday 6th June "Workshops day"
8 h		Welcome & Registration	Welcome & Registration		Welcome & Registration
9 h		Opening Session	Session IV Future trends in asphalt pavements	Welcome & Registration	Welcome & Registration Introduction
10 h		Keynote Lecture I		Session VIII Industry Session	Additives & Rejuvenators
11 h		Coffee + Posters	Coffee + Posters	Keynote Lecture I	Hot & Warm Recycling
12 h		Session I Sustainability and Circular Economy I	Session V Advanced Tests and Methods	Coffee + Posters	Coffee
13 h		Poster Presentations Session I	Poster Presentations Session II	Session IX Durability and Long term performance	Cold Recycling
14 h		Lunch + Posters + Steering Committee Meeting	Lunch + Posters	Poster award + EATA 2021 Presentation	Binder Activation and Life Cycle Assessment
15 h				Closing Session	Closing Session
16 h		Session II Sustainability and Circular Economy II	Session VI Mechanics of asphalt materials		Lunch
17 h		Coffee + Posters	Coffee + Posters		Introduction & Historical Background FAA Advisory Circular – AC 150/5320 – 6F
18 h	Alhambra Guided Visit*	Session III Sustainability and Circular Economy III	Session VII Aggregates impact on asphalt performance		Alizé – French Airport pavement design procedure
19 h					Coffee
20 h					FAARFIELD 1.42: Software overview Flexible pavement design & design exercise Ongoing research – (FFA and DGAC)
21 h	Refreshment*				
22 h		Welcome Cocktail	Gala Diner		Workshop I New needs and open problems on industrial applications of recycling of asphalt pavements
23 h					Workshop II Materials and Design for Airport Pavements

\*We are pleased to announce that we are offering a guided tour for the Alhambra and Generalife Gardens on Sunday 2nd June (evening). The places will be assigned considering participants' EATA registration dates (max. 40 people, and only for standard registrations). The visit will start at 4.30 pm on the Sunday and last for 3 hours. The visit will be followed by refreshments in the surrounding area. For those interested, please send an e-mail to [info@grxworkshop.com](mailto:info@grxworkshop.com) before the 1st of May 2019 with the subject "Alhambra visit registration" including your complete name and surname, and passport number. Because of the limited number of tickets available (the Alhambra is one of the most visited monuments in all of Spain) we cannot guarantee tickets for everyone.

## Sunday 2<sup>nd</sup> June. Alhambra Visit

The history of the Alhambra is linked with the geographical place where it is located: Granada. On a rocky hill rising above, on the banks of the River Darro, protected by mountains and surrounded by woods, among the oldest quarters in the city, the Alhambra rises up like an imposing castle with reddish tones in its ramparts that prevent the outside world from seeing the delicate beauty they enclose.

Originally designed as a military area, the Alhambra became the residence of royalty and of the court of Granada in the middle of the thirteenth century, after the establishment of the Nasrid kingdom and the construction of the first palace, by the founder king Mohammed ibn Yusuf ben Nasr, better known as Alhamar. Throughout the thirteenth, fourteenth and fifteenth centuries, the fortress became a citadel with high ramparts and defensive towers, which house two main areas: the military area, or Alcazaba, which houses the barracks of the royal guard, and the Medina or Court City, which is the location of the famous Nasrid Palaces and the remains of the houses of noblemen and plebeians who lived there. The Charles V Palace (which was built after the city was taken by the Catholic Monarchs in 1492) is also in the Medina. The complex of monuments also has an independent palace opposite the Alhambra, surrounded by orchards and gardens, which was where the Granadine kings relaxed: the Generalife.



## Monday 3<sup>rd</sup> June. Sustainability and Circular Economy

### Welcome & Registration (8:00-8:30)

Registration will take place from 8:00 to 8:30 in the hall on floor -2 of the Civil Engineering Faculty building, where the “conference bag” can also be collected.

### Opening Session (8:30-9:30)

**D<sup>a</sup>. Pilar Aranda Ramírez.** Rectora Magnífica de la Universidad de Granada.

**Prof. Montserrat Zamorano Toro.** Directora de la ETS de Ingenieros de Caminos, Canales y Puertos de la Universidad de Granada.

**D. Francisco Cuenca Rodríguez.** Alcalde de Granada.

**D<sup>a</sup>. María Francisca Carazo Villalonga.** Consejera de Fomento, Infraestructuras y Ordenación del Territorio de la Junta de Andalucía.

**D. Salvador Fernández Quesada.** Jefe Demarcación Andalucía Oriental, Ministerio de Fomento.

**Prof. M<sup>a</sup> Carmen Rubio Gámez.** Chair EATA 2019.

**Prof. Fernando Moreno Navarro.** Chair EATA 2019.

### Keynote Lecture I (9:30-10:15)

**“Sustainable Asphalt Experiences in California: Technologies, Cost and Environmental Impacts”**

John Harvey, UC Davis, California, USA

**Coffee Break Sponsored by CEPSA**  
(10:15-10:45)



Coffee break will be held in the hall on floor -3 of the Civil Engineering Faculty building.

During this break, attendants can visit the EATA 2019 poster exhibition sited on the same floor.

### **Session I: Sustainability and Circular Economy I (10:45-12:30)**

Chair: **Lily Poulidakos** (EMPA - Swiss Federal Laboratories for Materials Science and Technology)

- I.1. "Influence of Chemical Additives for Warm Mix Asphalts on the Short-Term Ageing of a Plain Bitumen".** Lu, X.; Ragni, D.; Ferrotti, G.; Canestrari, F.
- I.2. "Innovative pavement surfaces as Urban Heat Islands mitigation strategy: chromatic, thermal and mechanical characterization of clear/colored mixtures".** Pasetto, M; Pasquini, E; Giacomello, G; Baliello, A.
- I.3. "Influence of Crumb Rubber and Tafpack Super on Performances of SBS Modified Porous Asphalt Mixtures".** Jiao, Y.; Zhang, Y.; Zhang, L.; Guo, M.; Fu, L.
- I.4. "Use of plastic wastes from greenhouse in asphalt mixes manufactured by dry process".** Partal, P.; Martín-Alfonso, J.; Cuadri, A.; Torres, J.; Hidalgo, M.E.

### **Poster Presentations Session I (12:30-13:45)**

Chair: **Hassan Baaj** (University of Waterloo)

- **Design of fibre reinforced asphalt concrete with glass macrofibers. Comparative study of different design methods.** Presenter: Morea, F. (ARGENTINA).



- **Numerical Simulation of Crack Propagation in Flexible Asphalt Pavements Using Cohesive Zone Element.** Presenter: Oeser, M. (GERMANY).
- **Investigation of High-Modulus Asphalt Concrete (HMAC) Mixtures Containing Recycled Materials.** Leiva-Villacorta, F. (USA).
- **Evaluation of Cracking Potential of Warm Asphalt Mixes Containing Asphalt Shingles.** Leiva-Villacorta, F. (USA).
- **Investigating the performance of composite pavement under horizontal load using finite elements modelling.** Presenter: Taherkhani, H. (USA).
- **Comparison of flexible pavement responses computed from dynamic and backcalculated moduli.** Presenter: Timm, D. (USA).
- **Cooling Curve Analysis of Single Thick Lift Asphalt Pavements.** Presenter: McCarty, C. (USA).
- **Finite element implementation of huet–sayegh and 2s2p1d models for analysis of asphalt pavement structures in time domain.** Presenter: NGUYEN, H.T. T. (VIETNAM).
- **Binder and asphalt mix aging with Reclaimed Asphalt and rejuvenator.** Presenter: Porot, L. (FRANCE).
- **Estimating asphalt mixture volumetric properties using seemingly unrelated regression equations approaches.** Presenter: Haddock, J. (USA).
- **AsDim – Computer aided processing for the design of asphalt pavements.** Presenter: Mandahus, P. (AUSTRIA).
- **A design function for bitumen stabilised materials performance based on laboratory and field evaluation.** Presenter: Berman, CR. (SOUTH AFRICA).
- **Effects of aging on asphalt binder modified with microencapsulated phase change materials.** Presenter: Kakar, M. R. (SWITZERLAND).
- **Molecular dynamics modelling of bitumen-mineral interfacial adhesion with moisture and aging effects.** Presenter: Zhang, Y. (UK).



- **Microstructural and mechanical investigation of crumb rubber modified asphalt.** Presenter: Poulikakos, L. (SWITZERLAND).
- **Laboratory performance analysis of asphalt binder and hot mix asphalt modified with Nano-Silica.** Presenter: Xu-Ye, L. (COSTA RICA).
- **Investigating the rheological, low temperature, fatigue and rutting properties of different crumb rubber modified bitumen using the DSR.** Presenter: Canon Falla, G. (GERMANY).
- **Moisture damage resistance of bituminous mixtures manufactured with waste biomass fly ashes from the paper industry as filler.** Presenter: Rodríguez Pasandín, A. M. (SPAIN).
- **Use of Reacted and Activated Rubber in Ultra-thin HMA Overlay for Wet-freeze Climates.** Presenter: You, Z. (USA).
- **Field Ageing of Bitumen in Asphalt Mixture – Its Evolution over Time and Pavement Depth.** Presenter: Mirwald, J. (AUSTRIA).

#### Lunch Break (13:45-14:45)

Lunch break will be held in the restaurant on the main floor of the Civil Engineering Faculty building.

During this break the EATA Steering Committee Members will have their meeting.

#### Session II: Sustainability and Circular Economy II (14:45-16:30)

Chair: **Davide Lo Presti** (Università Degli Studi di Palermo)

- II.1. **“Laboratory mechanical characterization of Cold Recycled Mixtures produced with different RAP sources”.** Raschia, S.; Graziani, A.; Carter, A.; Perraton, D.
- II.2. **“Application and Validation of the Cohesion Test to Characterize Reclaimed Asphalt Pavement”.** Preti, F.; Tebaldi, G.; Romeo, E.; Carter, A.; Rahmanbeiki, A.; Gouveia, B.



- II.3. “Development of an Alternative Test Approach for Binder Blending Charts with Fine Aggregate Matrix Testing”.**  
Hung, S.; El Kashef, M.; Harvey, J.; Jones, D.
- II.4. “Ageing of rejuvenated bitumen in hot recycled bituminous mixtures: influence of bitumen origin and additive type”.**  
Bocci, E.; Mazzoni, G.; Canestrari, F.

**Coffee Break Sponsored by CEPSA**

(16:30-17:00)



Coffee break will be held in the hall on floor -3 of the Civil Engineering Faculty building.

During this break, attendants can visit the EATA 2019 poster exhibition sited on the same floor.

**Session III: Sustainability and Circular Economy III (17:00-18:45)**

Chair: **Juan José Potti** (ASEFMA - Asociación Española de Fabricantes de Mezclas Asfálticas)

- III.1. “Bio materials with Reclaimed Asphalt: from lab mixes properties to non-damaged full scale monitoring and mechanical simulation”.** Chailleux, E.; Blanc, J.; Hornych, P.; Williams, R. C.; Lo Presti, D.; Jimenez Del Barco Carrion, A.; Porot, L.; Planche, J-P; Pouget, S.
- III.2. “Investigation of the matric suction role on the curing mechanism of foamed asphalt stabilized mixtures”.** Kuchii-shi, A.; Antão, C.; Vasconcelos, K.; Pires, J.; Araújo, O. M.; Bernucci, L. L. B.; Lopes, R.
- III.3. “Intrinsic adhesive and cohesive assessment of the moisture sensitivity of bio-rejuvenated recycled asphalt binders”.** Jimenez Del Barco Carrion, A.; Carvajal Munoz, J.; Lo Presti, D.; Airey, G.

- III.4. “Rheological evaluation of asphalt blends at multiple rejuvenation and aging cycles”.** Koudelka, T.; Coufalik, P.; Fiedler, J.; Coufalikova, I.; Varaus, M.; Yin, F.

**Welcome Cocktail (20:30-23:00)**

EATA 2019 welcome cocktail will be held in “Palacio de los Cordova”.

Address: Cuesta del Chapiz, 2-4, 18010 Granada.

<https://goo.gl/maps/MY8RrVoDN1W7Y5Hs9>

## Tuesday 4<sup>th</sup> June. Emerging Materials and Technologies

**Welcome & Registration (8:00-8:30)**

Registration will take place from 8:00 to 8:30 in the hall on floor -2 of the Civil Engineering Faculty building, where the “conference bag” can also be collected.

**Session IV: Future trends in asphalt pavements (8:30-10:15)**

Chair: **Kim Jenkins** (Stellenbosch University)

- IV.1. “Life Cycle Sustainability Assessment of Electrified Road Systems”.** Balieu, R.; Chen, F.; Kringos, N.
- IV.2. “Microwave crack healing on conventional and modified asphalt mixtures with different additives: an experimental approach”.** Gonzalez, A.; Valderrama, J.; Norambuena-Contreras, J.



- IV.3. “Viscoelastic characterization of transparent binders for application on solar roads”.** Vizzari, D.; Chailleux, E.; Gennesseaux, E.; Lavaud, S.; Vignard, N.
- IV.4. “Towards road pavement response under moving loads”.** Barriera, M.; Lebental, B.; Pouget, S.

**Coffee Break Sponsored by TECOPSA**  
(10:15-10:45)

**TECOPSA**  
CONSTRUCCIÓN & SERVICIOS

Coffee break will be held in the hall on floor -3 of the Civil Engineering Faculty building.

During this break, attendants can visit the EATA 2019 poster exhibition sited on the same floor.

**Session V: Advanced Tests and Methods (10:45-12:30)**

Chair: **Luis Picado Santos** (Universidade de Lisboa)

- V.1. “Methodology for estimating the modulus of elasticity of bitumen under different aging conditions by AFM”.** Aguiar-Moya, J.; García, A.; Salazar-Delgado, J.; Baldi, A.; Loria-Salazar, L.
- V.2. “New approach for characterizing the performance of asphalt binders through the multiple stress creep and recovery test”.** Moreno-Navarro, F.; Tauste, R.; Sol-Sánchez, M.; Rubio-Gámez, M. C.
- V.3. “Mixture-Based Rheological Evaluation Tool for Cracking in Asphalt Pavements”.** Sias Daniel, J.; Ogbo, C.; Kaseer, F.; Os-hone, M.; Epps Martin, A.
- V.4. “Linear viscoelastic characterization of bituminous mixtures using random stress excitations”.** Graziani, A.; Cardone, F.; Virgili, A.; Canestrari, F.

**Poster Presentations Session II (12:30-13:30)**

Chair: **Emmanuel Chailleux (IFSTTAR)**

- **Properties of semi-blown bitumen containing residues from “Bottom of the Barrel” upgrading processes.** Presenter: Cerny, R. (CZECH REPUBLIC).
- **Experimental Characterisation of Storage Stability of Crumb Rubber Modified Bitumen.** Presenter: Wang, H. (THE NETHERLANDS)
- **New approaches in characterization of Fine Asphalt Mixes.** Presenter: Miranda Argüello, F. (COSTA RICA).
- **The chemistry behind rheological and thermal transitions of oxidized bitumen.** Presenter: Baldi, A. (COSTA RICA).
- **Relationship between chemical composition and crossover temperature of oxidized bitumen.** Presenter: Villegas, R. (COSTA RICA).
- **Rheological characterization of asphalt mixtures using a dynamic SCB test.** Presenter: Martinez, F. (ARGENTINA).
- **Analysis of Pavement structure in tunnel using Finite Element Modelling.** Presenter: Woldekidan, M. (THE NETHERLANDS).
- **New quality control method for the manufacture and layering of bituminous mixtures based on the Fenix Test.** Presenter: Bottella, R. (SPAIN).
- **Effect of bitumen characteristics obtained according to EN and Superpave specifications on asphalt mixture performance in low-temperature laboratory tests.** Presenter: Rys, D. (POLAND).
- **Evaluation of dynamic modulus ( $E^*$ ) master curve construction using field data.** Presenter: Plati, C. (GREECE).
- **Influence of water on the adhesiveness of the bituminous mastic using cellulose ashes as contribution filler.** Presenter: Movilla Quesada, D. (CHILE).



- **Use of copper slags as aggregate replacement in asphalt mixes: influence of particle size in tensile strength under moisture, aging and temperature conditions.** Presenter: Raposeiras, A. C. (CHILE).
- **Performance prediction of asphalt mixes with high RA contents using the German design approach.** Presenter: Blasl, A. (GERMANY).
- **Study of the application of Bio-Cutbacks from the Petroleum Plant on Prime Coat.** Presenter: Gondim, L. (BRAZIL).
- **Development of Rutting Model for Indian Highways based on Rut Depth Simulations using AASHTOWare.** Presenter: Krishnan, J. M. (INDIA).
- **Smart Geosynthetics For Strain Measurements In Asphalt Pavements.** Presenter: Lesueur, D. (FRANCE).
- **Using Polymer and Rubber Modified Asphalt Mixtures to Prevent Reflective Cracking on Airfield Pavements. Case Study: International Airport Ernesto Cortissoz, Barranquilla, Colombia.** Presenter: Fuentes, L. (COLOMBIA).
- **Heating capacity of asphalt mortars with metallic fibres under magnetic fields.** Presenter: Leiva-Padilla, P. (SPAIN).
- **Are we correctly measuring the rotational viscosity of modified bituminous binders?.** Presenter: Giancontieri, G. (ITALY).
- **Environmental impact of bio-based asphalt mixtures: Life Cycle Inventory, Life Cycle Assessment and recommendations.** Presenter: Mantalovas, K.(GREECE).

#### **Lunch Break (13:30-14:45)**

Lunch break will be held in the restaurant on the main floor of the Civil Engineering Faculty building.

**Session VI: Mechanics of asphalt materials** (14:45-16:30)

Chair: **Rodrigo Miró** (Universidad Politécnica de Cataluña)

- VI.1. “Numerical simulation of Falling / Heavy Weight Deflectometer test considering linear viscoelastic behaviour in bituminous layers and inertia effects”.** Roussel, J-M.; Sauzéat, C.; Di Benedetto, H.; Broutin, M.
- VI.2. “Probabilistic Prediction of Asphalt Pavement Performance”.** Abed, A.; Thom, N.; Neves, L.
- VI.3. “Precision of modal analysis to characterize the complex modulus of asphalt concrete”.** Gudmarsson, A.; Carret, J. C.; Pouget, S.; Nilsson, R.; Ahmed, A.; Di Benedetto, H.; Sauzéat, C.
- VI.4. “Experimental and Numerical Analysis of Asphalt Flow in a Slump Test”.** Chen, F.; Jelagin, D.; Partl, M.

**Coffee Break Sponsored by TECOPSA**  
(16:30-17:00)



Coffee break will be held in the hall on floor -3 of the Civil Engineering Faculty building.

During this break, attendants can visit the EATA 2019 poster exhibition found on the same floor.

**Session VII: Aggregates impact on asphalt performance** (17:00-18:45)

Chair: **Bernard Hofko** (Technical University of Wein)

- VII.1. “Influence of Aggregates Angularity on the Locking Point of Asphalt Mixtures”.** Huang, B.; Polaczyk, P.; Shu, X.; Gong, H.
- VII.2. “A new SMA mix design approach for optimization of stone-on-stone effect”.** Miranda, H.; Batista, F.; Antunes, M. L.; Neves, J.



- VII.3. “Aggregate-Binder Adhesiveness Assessment and Investigation of the Influence of Morphological and Physico-Chemical Properties of Mineral Aggregate”.** Lucas Júnior, J. L.; Babadopulos, L.; Soares, J.
- VII.4. “Thermo-hydro-mechanical behaviour of reclaimed asphalt aggregates without binder addition”.** Gaillard, L.; Chazallon, C.; Hornych, P.; Quezada, J.; Raab, C.

**Gala Diner (20:00-23:00)**

EATA 2019 Gala Dinner will be held in “Carmen de los Martires”.

Address: Paseo de los Mártires, s/n, 18009 Granada.

<https://goo.gl/maps/Tp9SKAhjz4FYR5Pm6>

## **Wednesday 5<sup>th</sup> June. Durability and Long term Performance**

**Welcome & Registration (8:45-9:15)**

Registration will take place from 8:00 to 8:30 in the hall on floor -2 of the Civil Engineering Faculty building, where the “conference bag” can also be collected.

**Session VIII: Industry Session (9:15-10:00)**

Chair: **Gabriele Tebaldi** (Università di Parma/University of Florida)

**VIII.1. “RARx: Circular economy on the road”.** de León, L.

**VIII.2. “High performance ultra-thin asphalt layer”.** Garcia Bòria, A.; Bobis Rojas, A.



**VIII.3. “Pavement heating systems for optimized wearing course design – a Spanish-German comparison”.** Uguet Canal, N., Johannsen, K.

**Keynote Lecture II (10:00-10:45)**

**“Durability of asphalt mixtures: Moisture Sensitivity – Adhesion, Cohesion and Diffusion”**

Gordon Airey, University of Nottingham, Nottingham, UK

**Coffee Break (10:45-11:15)**

Coffee break will be held in the hall on floor -3 of the Civil Engineering Faculty building.

During this break, attendants can visit the EATA 2019 poster exhibition sited on the same floor.

**Session IX: Durability and long term performance (11:15-13:00)**

Chair: **Kamilla Vasconcellos** (Universidade de Sao Paolo)

- IX.1. “Laboratory Simulation of the Impact of Solar Radiation and Moisture on Long-Term Age Conditioning of Asphalt Mixes”.** Azimi Alamdary, Y.; Singh, S.; Baaj, H.
- IX.2. “Investigation on the Combined Effect of Aging Temperature and Cooling Medium on Rheological Properties of Asphalt Binder”.** Cannone Falchetto, A.; Wang, D.; Riccardi, C.; Poulidakos, L.; Hofko, B.; Porot, L.; Wistuba, M.; Baaj, H.; Mikhailenko, P.; Moon, K. H.
- IX.3. “Development of a Rate-Dependent Cumulative Work and Instantaneous Power based Asphalt Cracking Performance Index”.** Dave, E.; Nemati, R.; Haslett, K.; Sias, J.
- IX.4. “Practical overlay design method for geogrid reinforcement of asphalt layers”.** Zofka, A.; Maliszewski, M.



**Best Poster Award Ceremony & EATA2021 Presentation (13:00-13:15)**

Before the closing ceremony, the winners of EATA 2019 Best Poster Award will be presented. After that, Bernhard Hofko will present next 9th EATA Conference to be held in Wein (Austria) in 2021.

**Closing Session (13:15-14:00)**

**D. Enrique Catalina Carmona.** Director General de Infraestructuras Consejería de Fomento, Infraestructuras y Ordenación del Territorio, Junta de Andalucía.

**D. Julio Caballero Sánchez.** Director Gerente Agencia de Obra Pública de la Junta de Andalucía (AOPJA).

**Prof. M<sup>a</sup> Carmen Rubio-Gámez.** Chair EATA 2019.

**Prof. Fernando Moreno-Navarro.** Chair EATA 2019.

**Prof. Hervé Di Benedetto.** Co-Chair EATA 2019.

**Spanish Lunch (14:00-15:15)**

As a goodbye, a Spanish Lunch will be provided by the EATA in the restaurant on the main floor of the Civil Engineering Faculty building.

**RILEM Technical Committees Meetings (14:30-19:30)**

Time	TC	Room
14:30-19:30	264-RAP	Salon de grados (-2 <sup>nd</sup> Floor)
14:30-16:30	272-PIM	Sala de Juntas (Main Floor)
14:30-16:30	279-WMR	Seminario 1 (4th Floor)
14:30-16:30	278-CHA	Seminario 2 (4th Floor)

TC 272-PIM: Phase and Interphase Behaviour of Bituminous Materials

TC 264-RAP: Asphalt Pavement Recycling

TC CHA: Crack Healing of Asphalt Pavement Materials

TC WMR: Valorisation of Waste and Secondary Materials for Roads





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## Posters List

The following posters will be presented at the EATA 2019 poster exhibition in the hall on floor -3 of the Civil Engineering Faculty building:

- P001. **Design of fibre reinforced asphalt concrete with glass macrofibers. Comparative study of different design methods.** Morea, Francisco; Zerbino, Raul
- P002. **Numerical Simulation of Crack Propagation in Flexible Asphalt Pavements Using Cohesive Zone Element.** Liu, Peng-fei; Wang, Dawei; Oeser, Markus; Wellner, Frohmut
- P003. **Investigation of High-Modulus Asphalt Concrete (HMAC) Mixtures Containing Recycled Materials.** Leiva-Villacorta, Fabricio; Taylor, Adam
- P004. **Evaluation of Cracking Potential of Warm Asphalt Mixes Containing Asphalt Shingles.** Leiva-Villacorta, Fabricio; West, Randy
- P005. **Investigating the performance of composite pavement under horizontal load using finite elements modelling.** Taherkhani, Hasan; Abdollaho Dorabad, hossein
- P006. **Comparison of flexible pavement responses computed from dynamic and backcalculated moduli.** Timm, David; Tutu, Kenneth
- P007. **Cooling Curve Analysis of Single Thick Lift Asphalt Pavements.** Timm, David; McCarty, Caroline
- P008. **Finite element implementation of huet–sayegh and 2s2p1d models for analysis of asphalt pavement structures in time domain.** Nguyen, H.T. Tai

- P009. **Binder and asphalt mix aging with Reclaimed Asphalt and rejuvenator.** Porot, Laurent
- P010. **Estimating asphalt mixture volumetric properties using seemingly unrelated regression equations approaches.** Montoya, Miguel; Haddock, John
- P011. **AsDim – Computer aided processing for the design of asphalt pavements.** Mandahus, Pia; Eberhardsteiner, Lukas; Blab, Ronald
- P012. **A design function for bitumen stabilised materials performance based on laboratory and field evaluation.** Bierman, CR., Prof Jenkins, KJ., Dr Rudman, C.
- P013. **Effects of aging on asphalt binder modified with micro-encapsulated phase change materials.** Kakar, Muhammad Rafiq; Refaa, Zakariaa; Worlitschek, Jörg; Stamatiou, Anastasia; Partl, Manfred; Bueno, Moises
- P014. **Molecular dynamics modelling of bitumen-mineral interfacial adhesion with moisture and aging effects.** Zhang, Yuqing; Gao, Yangming
- P015. **Microstructural and mechanical investigation of crumb rubber modified asphalt.** Poulidakos, Lily; Cavalli, Maria Chiara; Rodríguez-Fernández, Israel; Bueno, Moises
- P016. **Laboratory performance analysis of asphalt binder and hot mix asphalt modified with Nano-Silica.** Xu-Ye, Lilly; Leiva-Villacorta, Fabricio; Vargas-Nordbeck, Adriana; Aguiar-Moya, Jose
- P017. **Investigating the rheological, low temperature, fatigue and rutting properties of different crumb rubber modified bitumen using the DSR.** Leischner, Sabine; Canon Falla, Gustavo; Kraft, Juliane; Rochlani, Mrinali

- P018. **Moisture damage resistance of bituminous mixtures manufactured with waste biomass fly ashes from the paper industry as filler.** Rodríguez Pasandín, Ana María; Pérez, Ignacio; Gómez Meijide, Breixo; Ramírez Rodríguez, Antonio Ángel; Martín Cano, Miguel
- P019. **Use of Reacted and Activated Rubber in Ultra-thin HMA Overlay for Wet-freeze Climates.** You, Zhanping; Chen, Siyu; Gong, Fangyuan; Ge, Dongdong; Sousa, Jorge
- P020. **Field Ageing of Bitumen in Asphalt Mixture – Its Evolution over Time and Pavement Depth.** Mirwald, Steiner; Hofko, Bernhard.
- P021. **Properties of semi-blown bitumen containing residues from “Bottom of the Barrel” upgrading processes.** Cerny, Radek; Jisa, Petr.
- P022. **Experimental Characterisation of Storage Stability of Crumb Rubber Modified Bitumen.** Wang, Haopeng; Liu, Xueyan; Buchagul, Jirawat; Scarpas, Tom; Erkens, Sandra.
- P023. **New approaches in characterization of Fine Asphalt Mixes.** Miranda Argüello, Fabiola; Aguiar-Moya, Jose; Loria-Salazar, Luis.
- P024. **The chemistry behind rheological and thermal transitions of oxidized bitumen.** Baldi, Alejandra; Villegas, Rafael; Aguiar-Moya, Jose; Loria-Salazar, Luis
- P025. **Relationship between chemical composition and crossover temperature of oxidized bitumen.** Baldi, Alejandra; Villegas, Rafael; Aguiar-Moya, Jose; Loria-Salazar, Luis
- P026. **Rheological characterization of asphalt mixtures using a dynamic SCB test.** Martinez, Fernando; Cauhape Casaux, Marina; Angelone, Silvia



- P027. **Analysis of Pavement structure in tunnel using Finite Element Modelling.** Woldekidan, Milliyon; Huurman, Rien; Venendaal, Jan Willem
- P028. **New quality control method for the manufacture and layering of bituminous mixtures based on the Fenix Test.** Botella, Ramon; Pérez-Jiménez, Félix; Miro, Rodrigo; Puente, Bernat; Martinez, Adriana
- P029. **Effect of bitumen characteristics obtained according to EN and Superpave specifications on asphalt mixture performance in low-temperature laboratory tests.** Rys, Dawid; Jaczewski, Mariusz; Pszczola, Marek; Jaskula, Piotr
- P030. **Evaluation of dynamic modulus (E\*) master curve construction using field data.** Georgouli, Konstantina; Plati, Christina; Loizos, Andres
- P031. **Influence of water on the adhesiveness of the bituminous mastic using cellulose ashes as contribution filler.** Movilla Quesada, Diana; Raposeiras, Aitor C.; Muñoz, Osvaldo; Castro-Fresno, Daniel
- P032. **Use of copper slags as aggregate replacement in asphalt mixes: influence of particle size in tensile strength under moisture, aging and temperature conditions.** Raposeiras, Aitor C.; Movilla Quesada, Diana; Soto-Sandoval, Catalina; Berríos-Oyarzo, Constanza; Gatica-Molina, Armin; Castro-Fresno, Daniel
- P033. **Performance prediction of asphalt mixes with high RA contents using the German design approach.** Blasl, Anita; Kraft, Juliane; Wellner, Frohmut
- P034. **Study of the application of Bio-Cutbacks from the Petroleum Plant on Prime Coat.** Gondim, Lilian; Soares, Sandra; Barroso, Suelly



- P035. **Development of Rutting Model for Indian Highways based on Rut Depth Simulations using AASHTOWare.** Krishnan, J. Murali; Dokku, Bhanoj; Savio, Donia; Nivitha, M. R.
- P036. **Smart Geosynthetics For Strain Measurements In Asphalt Pavements.** Lesueur, Didier; Petit, Christophe; Millien, Anne; Leguernevel, Gwenael; Dopeux, Jérôme; Picoux, Benoît; Allou, Fatima; Fakhari - Tehrani, Fateh
- P037. **Using Polymer and Rubber Modified Asphalt Mixtures to Prevent Reflective Cracking on Airfield Pavements. Case Study: International Airport Ernesto Cortissoz, Barranquilla, Colombia.** Fuentes, Luis; Martinez-Arguelles, Gilberto; Torregroza, Lina; Alzate, Sara; Guerrero, Oswaldo
- P038. **Heating capacity of asphalt mortars with metallic fibres under magnetic fields.** Leiva-Padilla, P.; Moreno-Navarro, F.; Iglesias-Salto, G.; Rubio-Gámez, M. C.
- P039. **Are we correctly measuring the rotational viscosity of modified bituminous binders?** Giancontieri, Gaspare; Hargreaves, David; Lo Presti, Davide
- P040. **Environmental impact of bio-based asphalt mixtures: Life Cycle Inventory, Life Cycle Assessment and recommendations.** Mantalovas, Konstantinos; Jimenez Del Barco Carrion, Ana; Blanc, Juliette; Chailleux, Emmanuel; Hornych, Pierre; Planche, Jean-Pascal; Porot, Laurent; Pouget, Simon; Williams, R. Christopher; Lo Presti, Davide
- P041. **Development of High RAP Interlayer Mix Design for High Volume Roadways.** Podolsky, Joseph; Sotoodeh-Nia, Zahra; Manke, Nicholas; Huisman, Theodore; Williams, R. Christopher; Cochran, Eric



- P042. **Laboratory and in situ damage evaluation of geogrid used in asphalt concrete pavement.** Chazallon, Cyrille; Van Rompu, Julien; Nguyen, Mai Lan; Horny, Pierre; Doligez, Daniel; Brissaud, Laurent; Le Gal, Yves; Godard, Eric
- P043. **On Low Temperature Binder Testing using DSR 4mm Geometry.** Schrader, Johannes; Wistuba, Michael; Wang, Di; Remmler, Torsten
- P044. **Technical suitability of WMA mixtures with rubber added by the wet and the dry process.** Gallego, Juan; Maria Rodriguez-Alloza, Ana; Saiz, Leticia
- P045. **Surface assessment of a bituminous mixture type Stone Mastic Asphalt with crumb rubber by the dry process.** Vazquez, V.F.; Hidalgo, M.E.; Camara, A; Teran, Fernando; Huertas, P.; Ruiz-Teran, A.M.; Paje, Santiago
- P046. **Development of new texture evaluation methods for evaluating rolling resistance.** Kawakami, Atsushi; Shirai, Yu; Ishigaki, Tsutomu; Yabu, Masayuki
- P047. **Simple method to study the growth of bitumen foam bubbles.** Hugener, Martin; Hailesilassie, Biruk; Fang, Xing; Partl, Manfred
- P048. **High performance ultra-thin asphalt layer.** Garcia Bòria, Aida; Bobis Rojas, Alfredo
- P049. **Rheological characterization and morphological analysis of bituminous binders containing nano-sized additives.** Lidia Santoro, Haya Almutairi, Lucia Tsantilis, Peter Mikhalineko, Orazio Baglieri, Hassan Baaj
- P050. **Influence of aging conditions on the chemical property changes of asphalt binders.** Zhao, Kecheng; Wang, Yuhong; Li, Fangjin

- P051. **Rheology Study of Compounded Ground Tyre Rubber Modified Bitumen.** Hallmark, Brittany; Hernandez, Nacu; Cochran, Eric; Williams, Christopher
- P052. **Use of recycled polymer for the structural improvement of transport infrastructures.** Tauste-Martínez, R.; García-Travé, G.; Moreno-Navarro, F.; Sol-Sánchez, M.; Rubio-Gámez, M.C
- P053. **High-performance sustainable asphalt mixtures for high-volume traffic roads in severe climates.** Moreno-Navarro, F.; Sierra, J.; Sol-Sánchez, M.; García-Travé, G.; Rubio-Gámez, M.C; Castillo, M.; Estévez, E.





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## Exhibition Plan

The exhibition is located in the floor -2 of the of the Civil Engineering Faculty building.

1



2



3



4



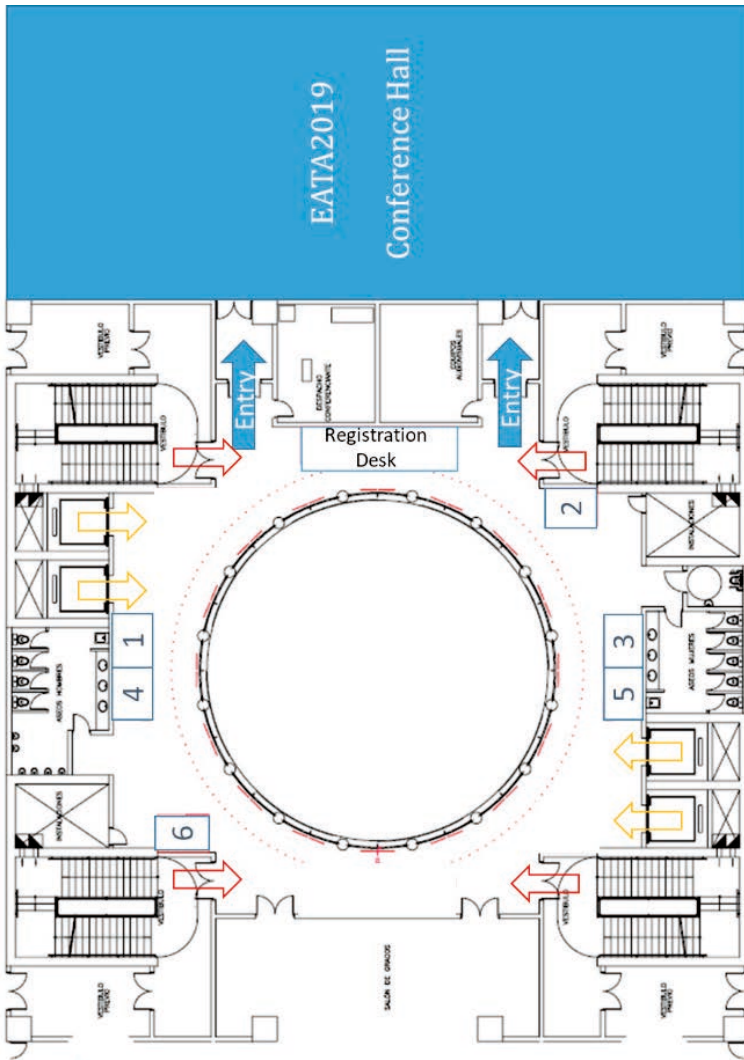
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6







➔ Access to the floor from stairways

➔ Access to the floor from elevators





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## Thursday 6<sup>th</sup> June. Workshops day

### Welcome & Registration (8:30-9:00)

Workshop participants can register from 8:45 to 9:15 in the hall placed on floor -2 of the Civil Engineering Faculty. The workshop will be held at “Salon de Grados” on floor -2 of the Civil Engineering Faculty.



### WORKSHOP I (Organized by RILEM Technical Committee 264)

#### “New needs and open problems on industrial applications of recycling of asphalt pavements”

This workshop will be focused on the different aspects of the recycling of asphalt pavements from the point of view of industries and agencies. Its main objective is to explore the main problems found by industry in order to identify where future research should be focused on in the upcoming years. Technical and technological aspects of different asphalt recycling techniques will be covered, as well as life-cycle assessments and the environmental impacts of these recycling technologies. The feedback from the workshop will be collected in a document named “**Industry Research Need Statements**” that will be published as a **Rilem Letter**.

The workshop is set to be a meeting point for **discussion among academia, industries and agencies**, in order to provide an exchange of ideas and a transfer of knowledge and expertise.

## Program:

**09:00 - 9:15** Introductions

**09:15 - 10:00** Presentations on Additives and Rejuvenators

**10:00 - 10:15** Open Discussion and Synthesis

**10:15 - 11:15** Presentations on Hot and Warm Recycling

**11:15 - 11:30** Open Discussion and Synthesis

**11:30 - 12:00** Coffee Break

**12:00 - 13:00** Presentations on Cold Recycling

**13:00 - 13:15** Open Discussion and Synthesis

**13:15 - 14:00** Presentations on Binder Activation and Life Cycle Assessment

**14:00 - 14:15** Open Discussion and Synthesis

**14:15 - 14:30** Closing Discussion



**WORKSHOP II**  
**(Organized by FAA & DGAC)**

**“Materials and Design for Airport Pavements”**

New generation aircraft, such as the Boeing 787 and Airbus 350, have tire pressures of up to 1.75 MPa. Since the effects of high tire pressure are localized and concentrated on the surface layers of the pavement structure, it becomes necessary to study the effects of high tire pressures on the asphalt concrete surfaces, and develop asphalt mix design procedures in order to withstand these anticipated higher tire pressures. Extensive research is being carried out to develop performance related specifications and high-performance materials that can withstand these high wheel loads and tire pressures. In addition to the materials related research, efforts are being made to develop improved analytical and design tools based on mechanistic principles.

This workshop will familiarize participants with the latest research and innovations going on in the field of hot mix asphalt materials and pavement design for airport pavements. For this purpose, the latest FAA (US Federal Aviation Administration) design procedures will be presented, with an emphasis on practical design examples for new flexible pavements (FAARFIELD 1.41 airport pavement design software will be provided, free of charge, to the attendees). Other topics covered in this workshop will include: design life, cumulative damage factors (CDF), pass/coverage ratio, subgrade and subbase layer characterization for design, etc. The FAARFIELD 1.41 methods of airport overlay design will be also covered if time permits.

Note: It is recommended that workshop participants bring their own laptops so they can install FAARFIELD 1.41 and follow along through the pavement design examples. Ample time will be provided for questions and discussion.



The FAARFIELD 1.41 software can be downloaded free of charge at:

<http://www.airporttech.tc.faa.gov/Download/Airport-Pavement-Software-Program>

Advisory Circular 150/5320-6F, "Airport Pavement Design and Evaluation" is available at:

[http://www.faa.gov/documentLibrary/media/Advisory\\_Circular/150-5320-6F.pdf](http://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5320-6F.pdf)

## **Program:**

**15:30 - 15:45** Introduction and overview of Workshop

**15:45 - 16:00** Historical background – Full scale tests & design procedures | Navneet Garg, FAA

**16:00 - 16:45** FAA Advisory Circular – AC 150/5320 – 6F | Navneet Garg, FAA

**16:45 - 17:45** Alizé – French Airport pavement design procedure | Michaël Broutin, DGAC

**17:45 - 18:00** Coffee Break

**18:00 - 18:45** FAARFIELD 1.42: Software overview

**18:45 - 19:30** FAARFIELD 1.42: Flexible pavement design & design exercise

**19:30 - 20:00** Ongoing research – FFA (USA) and DGAC (France)





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