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21st European Conference on Fracture, ECF21, 20-24 June 2016, Catania, Italy

## Editorial

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For the second time in the history of ESIS, the biennial European Conference of Fracture (ECF) was organized in Italy. In 1990 the ECF was held in Turin, in the northern Italy. Twenty-six years later, the picturesque Sicilian city of Catania hosted the 21<sup>st</sup> European Conference of Fracture (ECF21).

Sicilian ECF21 was characterized by some unique features. Among them, this conference was the first one with the proceedings being published in *Procedia Structural Integrity*, Elsevier's open access on-line repository covering Fracture, Fatigue and Structural Integrity. Furthermore, during the conference, the drafts of the proceedings papers as well as relevant organizing information were shared with the participants by equipping them with tablets. This allowed us to minimize the usage of paper, turning ECF21 into the very first “green” conference ever run by ESIS. We do hope that these two key aspects together with some other unique organizational peculiarities gave to the participants a lot of good memories to be brought home, such good memories together with the friendly hospitality of the Sicilians, the blue of the Sicilian sea and the aroma of the Sicilian evenings being with the ECF participants for a long time.

Selecting the plenary speakers was not a simple task, since the fracture community offers a great choice of outstanding researchers. To identify our esteemed plenary speakers, we used the following criteria: the plenary speakers had to be different from those attending the previous editions of the ECF, a uniform “geographical” distribution (trying to avoid geographical “polarization”) and, last, but not least, a close connection with the Italian Group of Fracture ([www.grupprofattura.it](http://www.grupprofattura.it)) – i.e., the Italian representative of ESIS that organized ECF21. This

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resulted in outstanding plenary lectures, with the first article published in this issue of *Procedia Structural Integrity* summarizing the key aspects covered by some of these talks.

The conference was organized by running a number mini-symposia, with each mini-symposium being led by invited chairpersons. The number of mini-symposia being organized by different colleagues was impressive, i.e.:

- ESIS TC4: Advanced Fracture Mechanics Testing of Polymers, Adhesives and Composites (Andrea Pavan, with many TC4 components: L. Banks-Sills, B. R. K. Blackman, R. Frassine, A. J. Kinloch, J.-A. Pascoe, M. Rink, L. Warnet, J. G. Williams);

- ESIS TC5- Dynamic Fracture (Y. Petrov, V. Silberschmidt);

- ESIS TC10: Environmentally Assisted Cracking & Hydrogen Embrittlement (J. Toribio);

- Constitutive modeling of cyclic plasticity and damage of materials (S. Krishna);

- Constraint Effects in Fracture (V. Shlyannikov, T. Meshii);

- Creep and fracture at elevated temperature (L. Esposito, C. Davies);

- Deformation and fracture at high strain rate (N. Bonora, E. Brown, N. Bourne, G. Mirone);

- Dissimilar metal welds: degradation phenomena and inspection (P. Trampus, L. Tóth, S. Szavai);

- Fatigue crack initiation and propagation in gigacycle regime (T. Palin-Luc, M. Zimmermann);

- Fracture in biomechanics: theoretical and experimental approaches to the resistance of biomaterials and medical devices (G. La Rosa);

- Fracture Nanomechanics (T. Kitamura, Z. Zhang, J. He);

- Functional fatigue, fracture and failure analysis of shape memory alloys and devices (A. Tuissi, C. Maletta);

- Local Approaches to Cleavage and Ductile Fracture (C. Ruggieri, F. Minami);

- Material Challenges for Extreme Oil and Gas Environments (M. Elboujdaini);

- Mixed mode fracture at different scales (L. Marsavina, F. Berto, M. Ayatolahy);

- Nonlinear, statistical and scaling aspects of damage-failure transition (O. Naimark, V. Loic, S. Santucci);

- Recent advances in the framework of Finite Fracture Mechanics (D. Leguillon, A. Sapora, V. Mantic);

- Structural integrity assessment of off-shore structures (A. Carlucci, D. Gentile);

- Thermomechanical fatigue testing and life assessment models (A. M. Meizoso);

- Thermal Methods for fatigue assessment (V. Crupi)

Considering that numerous reviewers were also involved in the reviewing process, and considering that several colleagues served as session chairmen during the conference, the number of volunteers that was involved in organization of ECF21 was really impressive!

In addition, further sessions were organized to allow those contributions that were not involved in specific minsymposia to be presented. These sessions were organized by the members of the IGF Ex-Co, i.e., V. Di Cocco, G. Ferro, D. Firrao, F. Iacoviello, C. Maletta, A. Pirondi, G. Risitano, A. Spagnoli and L. Susmel.

Finally, we would like to express our heartfelt thank to Angelo Finelli, the treasurer of both the IGF and ECF21: his long-time and continuous work as treasurer allowed all the events run by the IGF in the last decades as well as the organization of ECF21 to be very successful!

As a result of this team work, it was possible to organize ECF21 having about 700 presentations delivered by colleagues coming from 47 different countries. This issue of *Procedia Structural Integrity* containing 471 papers is the tangible proof of the scientific success of ECF21.

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