



ESIS Newsletter #65, January, 2020

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EDITORIAL BY THE ESIS PRESIDENT (Videoeditorial)

Dear friends,

first of all, some news...

The first one the **ESIS** concerns website. Now, all the ESIS Technical Committees can directly modify their "mini-websites" own using the Google Sites platform. All the TCs



have been asked to define a person in charge to handle the websites: these friends are authorized to directly upload news, reports,



events photos etc., and, even, to customize the TC website structure.

TCs are really important for ESIS and it is strategic for ESIS that they are active and vibrant. For this reason, for the "dormant" TCs (I mean, TCs that will not update their information in their websites and/or TCs without any activity in the last years), I will activate in Madeira, during the first day of the conference, the point III.9.4 of the Statutes:

"All ESIS members of a TC shall participate in the election of its Officers. Upon the election of Officers, the ESIS Secretariat should be informed and an announcement made in the ESIS Newsletter and the ESIS Website."

In this way, new and motivated "blood" will able to join the ESIS Council already during the meeting in Madeira (in the next months the ExCo will optimize the procedures for these elections). The list of the TCs officers to be renewed will be defined in April 2020.

Secondly, the ESIS ExCo approved the foundation of the ESIS Publishing House (ESIS-PH). Based on the OMP/PKP platform (Open Monograph Press | Public Knowledge Project), its mission is to offer to all the ESIS members, to the ESIS Technical Committees and to the ESIS National Groups, the possibility to publish online, completely free of charge, technical publications, monographies (both in English and in National Languages), scholarly editions (both in English and in National Languages) and edited volumes. All the volumes will be available on the platform with a CC-BY license (completely free of charge for the readers) and all the volumes will have their own ISBN code.

In order to fully activate this new service, we will need an Editorial board, that will be composed by the Executive Committee members, by one representative for each Technical Committee and by one representative for each National Group. For each category of publication, the reviewing procedures are ESIS-PH described in the website (https://www.esis-ph.eu/).

Being an **ESIS member has many advantages**. First of all, you belong to a great researchers community focussed on the structural integrity issues with a scientific production that is published in many journals and publication media. Among them, I wish to remember:

- The four Elsevier journals affiliated with ESIS: Engineering Failure Analysis, Engineering Fracture Mechanics, International Journal of Fatigue and Theoretical and Applied Fracture Mechanics. We encourage you to publish your articles in these journals. A list of special issues is within the pages of this Newsletter. - Procedia Structural Integrity (published by Elsevier, but directly coordinated by ESIS. Born in 016, eighteen issues have been published up to now. The journal is indexed in Scopus, Web of Science and Google Scholar.

- The new Publishing House, ESIS-PH.

Focussing *Procedia Structural integrity*, in 2019, we published five issues:

• Issue 14: SICE 2018 (2nd International Conference on Structural Integrity and Exhibition 2018)

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/14/suppl/C

• Issue 15: International Conference on Stents: Materials, Mechanics and Manufacturing ICS3M 2019

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/15/suppl/C

• Issue 16: 6th International Conference "Fracture Mechanics of Materials and Structural Integrity", FMSI 2019, 3–6 June, 2019, Lviv, Ukraine

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/16/suppl/C

• Issue 17: 3rd International Conference on Structural Integrity, ICSI 2019, 2-5 September 2019, Funchal, Madeira, Portugal

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/17/suppl/C

• Issue 18: 25th International Conference on Fracture and Structural Integrity

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/18/suppl/C

• Issue 19: Fatigue Design 2019, International Conference on Fatigue Design, 8th Edition

https://www.sciencedirect.com/journal/p rocedia-structural-integrity/vol/19/suppl/C

Many other issues will be soon online and it is a pleasure to confirm that this publication media is successful! In order to encourage TCs and National Groups to take advantage of this option, ESIS will support part of the publication costs (1500 euros as ESIS contribution).

The ESIS YouTube channel offers the video recordings of the presentations of the last ESIS Summer Schools and ECF events ... it is not far from 1000 subscribers!!

(http://www.youtube.com/c/EuropeanStructural IntegritySociety)

Every 6 months, an **ESIS NEWSLETTER** is sent to all the ESIS members thanks to the work of Valery Shlyannikov, who also follows the publication of the special issues in the four international journals affiliated with ESIS. In addition, an ESIS NEWS is sent monthly and a



Facebook page and a Telegram channel are active, in order to continuously update the ESIS members.

Facebook page: https://www.facebook.com/ESISweb/

Telegram channel: t.me/ESISweb

ESIS is requested to support many conferences, most of which are part of TC or National Group activities. In order to coordinate the dates and avoid conflicts, we suggest to TC and National Group Chairs to coordinate their meetings with the Vice President Aleksandar Sedmak. All the events are available in **the ESIS Google calendar**:

https://calendar.google.com/calendar/embed?sr c=esisweb.org%40gmail.com&ctz=Europe%2FR ome

ESIS Blog on imechanica: our blogger, Per Ståhle, has reviewed many papers from Engineering Fracture Mechanics. We have an agreement with Elsevier which allows open access of these papers for six months. Hence, everyone can have access to them and join in the discussion on the blog. We welcome your comments which may be posted on the blog: http://imechanica.org/node/9794

Google Account: ESIS activated an agreement with Google. All the ESIS members receive (completely free of charge) the credentials for an "improved" Google account, for example with a Google Drive of 30 Gb instead of the standard 15 Gb (the value of this service is about 50 euros per year).

Many new services are active in the G-Suite (e.g., Classroom, that is really useful for the organization of Summer Schools) and other services are improved if compared to the "standard" Google services. Here you can find some details:

- Google Classroom:

https://support.google.com/edu/classroom/? hl=en#topic=6020277

- Google Sites: <u>https://gsuite.google.com/learning-</u> <u>center/products/sites/get-started/</u>

- Google Drive: <u>https://gsuite.google.com/learning-</u> <u>center/products/drive/</u>

More details are available in the Google Learning center

(https://gsuite.google.com/learning-center/)

It is important to underline that with the activation of the *G* Suite account, each ESIS member:

- automatically guarantee that he/she will not misuse the account;

- understand that he/she is not authorized to send emails using the @structuralintegrity.eu account as ESIS. These new accounts allowed us to activate some *new services*:

- Each Technical Committee has now its own "miniwebsite, with the possibility to directly update the information.

- For each Technical Committee, a shared Google Drive folder is actieve. Filling the FORM and joining the TCs (one or more, it doesn't matter!), each ESIS member is able to share his/her publications (in the pre-print format), giving them more evidence, and each ESIS member will be always updated about the papers published by the other TC members on the topics of his/her interest (and, obviously, about the TC activities).

ESIS-TC subscription FORM: <u>http://www.structuralintegrity.eu/site/activity/tc</u> <u>-subscription</u>

How to share your papers in G Drive:

https://drive.google.com/file/d/0B6daTFbjjZI5R G9VTnZMZzNfbkU/view?usp=sharing

- In order to be always update about the activities organized by the ESIS Technical Committees of your interest, now the ESIS members can join the mailing lists managed directly by the TCs Chairmen. The procedure is really simple. The ESIS member has only to select the TC of his/her interest in the list he/she will find in all the ESIS NEWS we send monthly (also more than one!).

Finally, I would like to encourage you to join ESIS. In the ESIS website <u>www.structuralintegrity.eu</u> you will find different possibilities, starting from the "Individual membership" (30 euros). In the ESIS website you can find the list of the advantages of being an ESIS member ... I can confirm you that, thank to your continuous support, we are a successful Society!

I wish you all the best for 2020, hoping in your support for all the ESIS initiatives,

Francesco Iacoviello







Special Issues 2018-19

Journal	Title	Source	Editor	Status
Int J Fatigue	Special section on International Conference on Structural Integrity and Durability 2017, Fatigue of Materials and Structures at all Scales	ICSID 2017	Ž. Božic, L. Banks-Sills, M. Vormwald, D.M. Frangopol	IJF 112-116, July- November 2018
Int J Fatigue	Special Section on International Conference on Structural Integrity 2017	ICSI2017	P. Moreira, P. Tavares, S. Vantadori, A. Carpinteri	IJF 113-118, August 2018- January 2019
Eng Fract Mech	8th ESIS TC4 International Conference- Fracture of Polymers, Composites and Adhesives	8th ESIS TC4 International Conference	B. Blackman, A. Pavan	EFM 203, November 2018
Int J Fatigue	Fatigue crack paths 2018	Crack path 2018	A. Carpinteri, F.Berto, Y.Hong, Th.Palin-Luc	IJF 121-125, April- August 2019
Theor and Appl Fract Mech	Crack Paths 2018	Crack path 2018	A.Carpinteri, F.Iacoviello, L.Pook, S.Vantadori	TAFM, 2019 (virtual SI)
Eng Failure Anal	2nd International Conference on Structural Integrity and Durability	ICSID 2018	Ž.Božić, R.Clegg, L.Banks-Sills, F.Berto, F.Iacoviello	EFA, 2019 (virtual SI)
Eng Failure Anal	ECF22 2018	ECF22		EFA, 2019 (virtual SI)
Eng Failure Anal	ISRAS-TC12	International Symposium on Risk analysis and Safety of Large Structures and Components	J.A.Correia; A.Sedmak; V.Moskvichev; A.Jesus; M.Muñiz- Calvente	EFA, 2019 (virtual SI)



National Committees

Croatia

Report on ICSID 2019 http://icsid2019.fsb.hr/

3rd International Conference on Structural Integrity and Durability 2019 (ICSID 2019) and **Summer School "Fatigue and Fracture Modeling and Analysis"**, were organized by the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb, in Dubrovnik, Croatia, from June 3 - 7, 2019. The events were endorsed by the European Structural Integrity Society.

ICSID 2019 and the Summer School were held at the <u>Centre for Advanced Academic</u> <u>Studies</u> in the <u>city of Dubrovnik</u>. The magnificent old building of the Centre for Advanced Academic Studies (CAAS) is situated in the center of Dubrovnik on the Croatian Adriatic Coast, in the vicinity of the most prominent historical places of the Old Town.



Centre for Advanced Academic Studies in Dubrovnik (CAAS)

Summer School "Fatigue and Fracture Modeling and Analysis", was organized prior to the ICSID 2019 conference, from June 3 - 4, 2019.

Summer School Organizing Committee

Željko Božić (Croatia), Chair Siegfried Schmauder (Germany) Luca Susmel (UK) Yury Matvienko (Russia) Richard E. Clegg (Australia) The Summer School provided an opportunity for students, researchers and engineers from academia and industry to get acquainted with fundamental aspects of fracture mechanics, recent trends in practical applications of fatigue and fracture models, and advanced approaches such as multiscale materials modelling.

Senior researchers and experts, distinguished scientists in the field, gave lectures on experimental and numerical techniques for modelling, analysis and assessment of damaged components and structures. Examples on linear and elastic-plastic fracture mechanics models, damage mechanics models and multiscale modelling used for fatigue, fracture and failure analysis of structural materials and components were presented.



Summer School attendees and lecturers



Summer School participants at a lecture

Summer School Agenda

The Summer School was attended by 14 participants from 10 countries. We got excellent feedback from the participants regarding the lecture topics and the Summer School organization in general.



Date/Time	Title	Lecturer
June 3, 2019 09.00 – 12.00	<u>Fundamentals</u> of <u>Two-</u> <u>parameter</u> <u>Elastic and</u> <u>Elastic-plastic</u> <u>Fracture</u> <u>Mechanics</u>	Yury Matvienko, Mechanical Engineering Research Institute of the Russian Academy of Sciences
June 3, 2019 14.00 - 17.00	<u>Multiaxial</u> <u>fatigue</u> <u>assessment of</u> <u>metallic</u> <u>components</u>	<u>Luca Susmel</u> , The University of Sheffield
June 4, 2019 09.00 – 12.00	Multiscale Materials Modeling - Recent developments and applications	<u>Siegfried</u> <u>Schmauder</u> , University of Stuttgart
June 4, 2019 14.00 – 17.00	<u>Engineering</u> <u>Failure</u> <u>Analysis</u>	Richard E. Clegg, Queensland University of Technology Editor-in-Chief Engineering Failure Analysis

International Conference on Structural Integrity and Durability 2019 (ICSID 2019) was held in the Centre for Advanced Academic Studies in Dubrovnik from June 4 - 7, 2019.

The ICSID 2019 conference managed to bring together about 70 scientists and engineers from 26 countries from around the world to discuss how to characterize, analyse, predict and asses the fatigue and fracture of structural materials and components. ICSID 2019 was a forum for discussion of the present and future trends in experimental, analytical and numerical fracture mechanics, fatigue, structural integrity assessment, failure analysis, and other important topics in the field.

Accepted two-page abstracts, were published in the Book of Abstracts with an ISBN number (ISSN 2584-3907). The full papers were published on electronic media with an ISBN number (ISSN 2584-3982). **Conftool** <u>Conference Management System</u> has been used for participants and manuscript administration. Six **Plenary lectures** were given at the ICSID 2019 conference by leading scientists in the field:

Yury Matvienko, Professor

Mechanical Engineering Research Institute, Russian Academy of Sciences, Moscow, Russia

<u>"The Effect of Crack-tip Constraint in Fracture</u> <u>Mechanics"</u>

Luca Susmel, Professor

Department of Civil and Structural Engineering, The University of Sheffield, UK

<u>"Fatigue assessment of plain and notched 3D-printed PLA"</u>

Željko Domazet, Professor

Faculty of Electrical Engineering, Mechanical , Engineering and Naval Architecture University of Split, Croatia

<u>"Fatigue crack retardation and repair</u> <u>methods"</u>

Richard E. Clegg, Dr.

Editor-in-Chief, Engineering Failure Analysis, Queensland University of Technology, Brisbane, Australia

<u>"Liquid metal induced embrittlement and</u> <u>structural integrity"</u>

Aleksandar Sedmak, Professor

Faculty of Mechanical Engineering, University of Belgrade, Serbia

"Risk based approach to life assessment of welded structures"

Siegfried Schmauder, Professor

University of Stuttgart, Institute for Materials Testing, Materials Science and Strength of Materials (IMWF)

<u>"Multiscale Modelling - Computer Design of</u> <u>Materials</u>"

Selected papers presented at the ICSID 2019 Conference will be published in a Special Issue of the International Journal of Engineering Failure Analysis.







ICSID 2019 Conference opening



ICSID 2019 Conference – oral presentations



ICSID 2019 Conference – poster presentations



ICSID 2019 Conference – a plenary lecture

Photo gallery: http://icsid2019.fsb.hr/

I would like to thank to all participants of the ICSID 2019 conference for their contribution and many high-quality papers. I am very much indebted to the Scientific Committee Members for their invaluable help, suggestions and advice in the Conference organization.

The Conference was supported by the Ministry of Science and Education of the Republic of Croatia, and by the European Structural Integrity Society (ESIS). The support is gratefully acknowledged.

Željko Božić ICSID 2019 Conference Chair

Report on IWCMM29 http://iwcmm29.fsb.hr/

29th International Workshop on Computational Mechanics of Materials (IWCMM29) was organized by the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb and by the Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, in Dubrovnik, Croatia, from September 15-18, 2019.

IWCMM29 was held at the <u>Centre for</u> <u>Advanced Academic Studies</u> in the <u>city of</u> <u>Dubrovnik</u>. The magnificent old building of the Centre for Advanced Academic Studies (CAAS) is situated in the center of Dubrovnik on the Croatian Adriatic Coast, in the vicinity of the most prominent historical places of the Old Town.



Centre for Advanced Academic Studies in Dubrovnik (CAAS)

IWCMM series of workshops was initiated by Professor Siegfried Schmauder from the Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, in 1991. Previous IWCMM workshops were held in Glasgow, UK in 2018; in Leuven,



Belgium in 2017; in Tomsk, Russia in 2016; in Bochum, Germany in 2015; in Madrid, Spain in 2014; Singapore in 2013, in Baltimore, USA in 2012; in Limerick, Ireland in 2011; in Loughborough, UK in 2010; in Constanta, Romania in 2009; in Beijing, China in 2008; in Paris, France in 2007; in Lublin, Poland in 2006; in Düsseldorf, Germany in 2005; in Goa, India in 2004; in Magdeburg, Germany in 2003; in Darmstadt, Germany in 2002; in Freiberg, Germany in 2001; in Galway, Ireland in 2000; in Berlin, Germany in 1999; in Stuttgart, Germany in 1998; in Vienna, Austria in 1997; in Hamburg, Germany in 1996; in Aachen, Germany in 1995; in Lille, France in 1994; and in Stuttgart, Germany in 1993, 1992 and 1991.

The objective of the 29th International Workshop on Computational Mechanics of Materials was to bring together researchers and specialists from academia, industry and government from all over the world to discuss latest advancements and new trends in various areas related to computational mechanics of materials. The workshop was intended to cover all aspects of modelling, simulations and analyses of the mechanical behaviour at different length and time scales. It provided a platform for discussion of deformation, fatigue and fracture mechanisms under different loading and environmental conditions. The materials of interest range from traditional materials such as metals, alloys, polymers and composites to advanced materials and bio-materials. Plenary lectures, mini-symposia with keynote lectures and regular presentations were be the workshop highlights.

The IWCMM29 International Workshop managed to bring together about 90 scientists and engineers from 24 countries from around the world. Accepted one-page abstracts, were published in the Book of Abstracts with an ISBN number (ISBN 978-953-7738-68-6). **Conftool** <u>Conference Management System</u> has been used for participants and manuscript administration.

Six **Plenary lectures** were given at IWCMM29 by leading scientists in the field:

Alan Needleman, Professor, Materials Science and Engineering, Texas A&M University <u>"Mesoscale Modeling of Discrete Shear</u> <u>Transformation Zone (STZ) Plasticity"</u>

Erkan Oterkus, Associate Professor, University of Strathclyde, Glasgow "Peridynamics: Past, Present and Future"

Joško Ožbolt, Associate Professor, Institute of Construction Materials, University of Stuttgart <u>"Modelling Corrosion of Steel in Concrete:</u> Past, Present and Future"

<u>Reinhard Pippan</u>, Professor, Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences "Fracture Toughness of Tungsten, physical mechanism, experiments, and simulations"

Jianying He, Professor, Norwegian University of Science and Technology (NTNU) "Nanomechanics of metal coated polymer particles"

<u>Robert Skelton</u>, Professor, Texas A&M Engineering Experiment Station (TEES), Texas A&M University

"A Journey toward integrating material, structure, signal processing, and control design"



Selected papers presented at the ICSID 2019 Conference will be published in Special Issuees of the Continuum Mechanics and Thermodynamics and the Material Design & Processing Communications.



IWCMM29 Workshop opening





IWCMM29 Workshop – oral presentations



IWCMM29 Workshop – a plenary lecture



IWCMM29 Workshop dinner



IWCMM29 Workshop flyer

Photo gallery: http://icsid2019.fsb.hr/

I would like to thank to all participants of the IWCMM29 Workshop for their contribution and many high-quality papers. I am very much indebted to my colleague Prof. Siegfried Schmauder, the Workshop Chair for entrusting me with the Workshop organization and for his invaluable help, suggestions and advice in the Workshop organization.

The Workshop was supported by the Ministry of Science and Education of the Republic of Croatia. The support is gratefully acknowledged.

> Željko Božić IWCMM29 Workshop Chair

Italy

Italian Group of Fracture activity

In the last six months, the IGF (Italian Group of Fracture) activity was focused on:

- IGF journal (Frattura ed Integrità Strutturale): two issues have been published (October 2019 and January 2020), with about 100 published papers.
- The publication of a Procedia Structural Integrity issue entitled "25th International Conference on Fracture and Structural Integrity" with more than 110 papers.

In the next months, IGF will organize:

 VCSI 2020, the First Virtual Conference on Structural Integrity, with the Portuguese Structural Integrity Society, the DIVK (Serbian Structural Integrity group) and the Greek Society of Experimental Mechanics of Materials. The event will be held online on January 16th, 2020. (https://www.vcsi1.eu/)



1st Mediterranean Conference on Fracture and Structural Integrity, MedFract1, with the Greek Society of Experimental



Mechanics of Materials. The event will be held in Athens on February 26-28, 2020. (http://www.medfract1.eu/)



Proceedings of both events will be published in two issues of Procedia Structural Integrity.

Francesco Iacoviello

Switzerland

The one-day annual meeting of the Swiss ESIS members in 2020 will be held jointly with the Committee on Structural Integrity of SVMT (Swiss Association for Materials and Technology) at "Fachhochschule Luzern (FHLU – Technik und Architektur)" at Technikumstrasse 21, CH-6048 Horw (Switzerland) on Tuesday, March 25, 2020, hosted by Mr Dejan Romancuk. The theme for the meeting, the detailed directions, the meeting time and the program will be communicated later. The meeting will be held in German (as usual).

Andreas J. Brunner

TECHNICAL COMMITTEES

TC1: Elastic Plastic Fracture Mechanics

Joint Meeting of ESIS TC1 and DVM/DVS Working Group "Fracture Mechanics of Weldments"

We would like to draw your attention to a meeting co-organised by the Technical Committee TC1 of the European Structural Integrity Society (ESIS) and the working group "Fracture mechanics of weldments" of DVM/DVS (German Association for Materials Research and Materials Testing/German Welding Society) that will take place on 10 – 11 March 2020 and hosted by Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany.

Notwithstanding a number of approaches, the problem of adequate consideration of the effect of welding residual stresses on structural integrity of components with cracks is of great concern. This is due to the complexity of the subject, which includes various aspects such as a representative determination of the residual stress state and the interaction between residual stresses and external applied loading. The aim of the meeting is to provide an expert discussion of the current state of knowledge in the field with special emphasis on practical aspects such as new developments in existing standards and FFS codes.

A number of presentations will be given during the meeting covering the following topics:

• Residual stress state in weldments (aswelded and post-weld heat treated)

• Primary and secondary stresses – classification and treatment in fracture mechanics analyses

• Stability of welding residual stresses under mechanical and thermal loading

We would be pleased to welcome you in Freiburg. Please, send your registration to the following address: Dr. I. Varfolomeev, Fraunhofer IWM, Freiburg, igor.varfolomeev@iwm.fraunhofer.de.

If you want to give a presentation, please, submit the title and a short abstract. The tentative timeframe of the meeting is from Tuesday (10th of March) noon until Wednesdey (11th of March) noon. In order to have ample time for discussion, the number of presentations should not exceed 10 to 12. Several presentations about new developments of the BS 7910 document, which will be updated at the end of this year, have already been included in the program. At the end we plan a round table discussion in order to summarize the results of the meeting.

> Uwe Zerbst Igor Varfolomeev

TC3: Fatigue Of Engineering Materials And Structures

Statutes and activities of ESIS Technical Committee No.3 (TC3) - December 2019

1. Name

TC3 : FATIGUE of ENGINEERING MATERIALS and STRUCTURES

Chairmen: Andrea Carpinteri and Les P. Pook



Secretaries: Andrea Spagnoli and Sabrina Vantadori

2. Objectives of TC3

(a) **Special Issue** of **International Journal of Fatigue** entitled **"Fatigue from crack initiation to failure: role of defects and life assessment"** (Guest Editors: Aleksandar Sedmak, Filippo Berto, Andrea Carpinteri, Uwe Zerbst), with papers selected from those presented at the 22nd European Conference on Fracture (ECF22), held in Belgrade, Serbia, 26th to 31st August, 2018.

(b) Special Issue of International Journal of Fatigue, entitled "Multiaxial Fatigue 2019"

(Guest Editors: Andrea Carpinteri, Fionn Dunne, Ali Fatemi, Franck Morel, Thierry Palin-Luc), with papers selected from those presented at the 12th International Conference on Multiaxial Fatigue and Fracture (ICMFF12), held in Bordeaux, France, 24th to 26th June, 2019.

(c) **Special Issue** of **Theoretical and Applied Fracture Mechanics**, entitled **"Multiaxial Fracture 2019"** (Guest Editors: Andrea Carpinteri, Masahiro Endo, Franck Morel, Thierry Palin-Luc, Michael Vormwald), with papers selected from those presented at the 12th International Conference on Multiaxial Fatigue and Fracture (ICMFF12), held in Bordeaux, France, 24th to 26th June, 2019.

3. Achievement of objectives

(a) **Special Issue** of **'International Journal of Fatigue'** entitled **'International Conference on Structural Integrity 2017'** (Guest Editors: Pedro Moreira, Porto, Portugal, Paulo Tavares, Porto, Portugal, Sabrina Vantadori, Parma, Italy, and Andrea Carpinteri, Parma, Italy), with papers selected from those presented at the International Conference on Structural Integrity 2017 (ICSI 2017), held in Funchal, Madeira, Portugal, 4 - 7 September, 2017.

(b) 12th International Conference on Multiaxial Fatigue and Fracture (ICMFF12),

held in Bordeaux, France, 24th to 26th June, 2019. Chairpersons: Thierry Palin-Luc (Talence, France), Franck Morel (Angers, France), and Andrea Carpinteri (Parma, Italy).

Andrea Carpinteri Les P. Pook

TC11: High Temperature Mechanical Testing

The 4th TMF-Workshop 2019 was held very successfully on 13-15 November 2019 at BAM in

Berlin, Germany. The workshop was attended by approx. 100 attendees from 17 countries. 33 oral presentations and 3 poster presentations were held in the sessions Industrial TMF applications, TMF crack growth, advanced TMF testing techniques, TMF simulation and modelling and TMF properties. A wide spectrum of industrial sectors was represented including power plant, automotive, aerospace (gas turbines) and rocket engines which indicated the importance of Thermo-Mechanical Fatigue today. Selected full papers will be published in the International Journal of Fatigue as a virtual special issue. 12 full papers have been submitted, and the peer review process has already been started.

The 5th International ECCC Creep & Fracture Conference will take place on 13-17th September 2020 in Edinburgh, please see www.eccc2020.com. It will be co-organized by the European Creep Collaborative Committee ECCC, the Energy Materials Group of IOM3 and the UK High Temperature Power Plant Forum which is an independent working group of TC11. The conference venue is the InterContinental Edinburgh The George Hotel. The deadline for submission of abstracts is 15th December 2019. The registration is open on the conference website.

The next TC11 main committee meeting is scheduled for 21 April 2020 at Nottingham University, UK. The next TC11 temperature measurement working group meeting is planned to be held on 22th January 2020 at CCPI in Sheffield, UK.

Hellmuth Klingelhöffer

TC13: Education and Training

The 6th Summer School on Fracture Mechanics took place from 13th September to 15th September 2019 in Cracow, Poland. The School was held at the AGH University of Science and Technology campus at Faculty of Mechanical Engineering and Robotics.

The organizers of the School were:

- European Structural Integrity Society,
- Kielce University of Technology,
- Polish Group of Fracture Mechanics.

The organizing committee was composed of three person from Poland: Jaroslaw Galkiewicz – chairman, Tomasz Machniewicz – representative of the AGH University of Science and Technology and Urszula Janus-Galkiewicz – secretary.









The Summer School provided an opportunity for students, researchers and engineers from university and industry to get acquainted with fundamental aspects of fracture mechanics, recent trends in practical applications of fatigue and fracture models, and advanced approaches such as multiscale materials modelling.

40 students took part in the School. They come from 14 countries. Together with the lecturers it gives 44 persons. The School can be called pan-European since we have representatives of 16 European countries: from Portugal on the West to Russia on the East; from Italy on the South to Norway on the North.

On ECF 23 in Serbia four top-level scientist, and members of ESIS, agreed to join the school as the lecturers. They were Prof. Jacques Besson (France), Prof. Meinhard Kuna (Germany), Prof. Andrzej Neimitz (Poland), Prof. Zhiliang Zhang (Norway). Each of them presented proposed subject in single 3 hours long block. They were as follows: Prof. Andrzej Neimitz, Kielce University of Technology entitled Fundamentals of linear elastic and elastic-plastic fracture mechanics; Prof. Zhiliang Zhang, Norwegian Universitv of Science and Technology Constraints effect in fracture; Prof. Jacques Besson, Mines ParisTech, Local approach to fracture for ductile failure; Prof. Meinhard Kuna, TU Bergakademie Freiberg, Numerical methods in fracture mechanics.



On Sunday after the lectures students had an opportunity to see another lecture, this time on history of Poland and the world since they were taken to visit Memorial and Museum Auschwitz-Birkenau Former German Nazi Concentration and Extermination Camp.

Participants from Ukraine handed over Organizers of the School some copies of the book Panasyuk V., Kaspszak W. Summer Schools on Fracture Mechanics. – Lviv: Prostir-M Publishing House, 2017 – 186 p. Overview of the activity the Polish-Ukrainian-German Summer Schools on Fracture Mechanics during 1995– 2015 years was transformed in 2015 to ESIS Summer Schools.

After the School each participant received Certificate of Attendance. http://summerschool2019.tu.kielce.pl/

> Petro Yasniy Jaroslaw Galkiewicz



TC13: Education and Training and TC15: Structural Integrity of Additive Manufactured Components announces the next actions on the framework of the Twinning project: Eastern European twinning on Structural Integrity and Reliability of Advanced Materials obtained through additive Manufacturing (SIRAMM).

- 1st Summer School: Trends on Additive Manufacturing for Engineering Applications, 23-27 August 2020 at University Politehnica Timisoara, Romania
- 1st Workshop: Structural Integrity of Additive Manufactured Materials, 28-29 August 2020 at University Politehnica Timisoara, Romania

The 3 year project starts on 1st October 2019 and represent a cooperation between University Politehnica Timisoara (Romania), University of Belgrade (Serbia), Institute of Physics of Materials, Academy of Sciences (Czech Republic), University of Parma (Italy) and Norwegian University of Science and Technology (Norway).

The overall objective of the SIRAMM project is to significantly strengthen research in the AM field at the Politehnica University of Timisoara (UPT, Romania). To achieve this aim, SIRAMM will build upon the existing science and innovation base of UPT, creating a network with two internationally-leading counterparts at EU level: Norwegian University of Science and Technology (Norway) and the University of Parma (Italy). In the long term, the project aims at laying the foundations for creating a pole of excellence on AM in Eastern Europe. For this reason, other two partners from low R&I performing countries, the University of Belgrade (Serbia) and the Institute of Physics of Materials, Academy of Sciences (Czech Republic) will also take part in this Twinning project.

More details about the project could be found at: <u>http://www.siramm.unipr.it/</u>

Liviu MARSAVINA

TC14: Integrity of Biomedical and Biological Materials

1. In July 2019 TC 14 successfully organised the International Conference on Stents: Materials, Mechanics and Manufacturing in London, UK. Two keynote lectures were delivered by the leading specialists:

- Prof. Francesco Migliavacca, Polytechnic University of Milan, Italy: "Past, Present and Fuyture of Stent Modeling" - Dr Syed Hossainy: Abbott Vascular, USA: "Engineering Principles in Drug Eluting Stent"

The conference's scientific programme contained a good mix of works performed in academia, industrial companies and hospitals. Its social programme included a visit to Windsor Castle (see figure)



A Special Issue of Procedia Structural Integrity with some papers form the conference - <u>Volume 15, 2019</u> – was published.

TC 14 held its **annual Technical Committee Meeting** within the framework of this conference. It was agreed to continue the series of International Conference on Stents: Materials, Mechanics and Manufacturing every two-three years, with the next conference organised outside the UK. A closer link with industrial companies and clinicians will be sought.

2. Thematic Symposium "Integrity of Biomedical and Biological Materials" will be organised by Technical Committee 14 within the framework of the 23rd European Conference on Fracture – ECF23 to be held in Funchal, Madeira, Portugal, 27 June – 3 July 2020. A Special issue of the **Journal of the Mechanical Behavior of Biomedical Materials** published by Elsevier "Damage and Fracture of Biomedical Materials"

is planned, with ESIS TC14 Chair Prof. Vadim V. Silberschmidt as its Guest Editor.

The submission of manuscripts will be open on 10 July 2020 and closed on 31 October 2020.

Vadim V. Silberschmidt

TC15: Structural Integrity of Additively Manufactured Components

ESIAM19

The First European Conference on Structural Integrity of Additively Manufactured Materials (ESIAM19) has been hosted at <u>Clarion Hotel &</u> <u>Congress</u> in <u>Trondheim</u>, Norway, 9 - 10 - 11



September 2019. The conference was very successful with 180 delegates from all over the world. We thank all the participants for the kind attendance.

Structural integrity, i.e. the fracture and fatigue strength of additively manufactured materials and components is becoming increasingly important with the technology's transition towards major industrial utilization. The conference has provided an overview over current scientific knowledge and stimulate ideas for future research directions in this emerging field. ESIAM19 has been the opening event for a biannual conference series held in Europe.

The next conference ESIAM21 will be in Wien from 8th to 10th of September 2021. Further information will be provided soon on the conference venue and on the program.

Some pictures of the successful event in Trondheim are shown below.



ESIAM19 venue



ESIAM19 Gala Dinner



ESIAM 19 poster session



A conference session at ESIAM 19

Conference Papers. Extended versions of selected papers are now invited for Special Issues in ESIS affiliated journals.

A dedicated section of TC15 is planned for ECF23 in Madeira where future plans of TC15 will be also discussed.

> Filippo Berto Luca Susmel



1st International Workshop on Plasticity, Damage and Fracture of Engineering Materials (report)

22-23 August 2019, Ankara, TURKEY



The 1st International Workshop on Plasticity, Damage and Fracture of Engineering Materials was held in Ankara on August 22-23 at the TOBB University Conference Center. The meeting was co-organized by Middle East Technical University and TOBB University of Economics and Technology, co-chaired by Assoc. Prof. Dr. Tuncay Yalcinkaya (METU) and Assoc. Prof. Dr. Cihan Tekoglu (TOBB Uni.) and co-organized by Assoc. Prof. Dr. Husnu Dal (METU, Mechanical Engineering), Assoc. Prof. Dr. Mert Efe (METU, Materials Engineering), Assoc. Prof. Dr. Ercan Gurses (METU, Aerospace Engineering), Assoc. Prof. Dr. Cihan Tekoglu (TOBB Uni., Mechanical Engineering), Assoc. Prof. Dr. Tuncay Yalcinkaya (METU, Aerospace Engineering), with 42 scientists from 20 different countries in the Scientific Committee.



The 2 day meeting hosted 6 invited plenary lecturers from 6 different countries and 51 contributed talks/poster presentations from all over the world (Azarbaijan , Australia, France, India, Japan, Germany, Malaysia, Norway, South Korea, Ukraine, Iran, Italy, Turkey , The Netherlands, US, UK). There were in total around 100 attendees at the event.



The registration fee was much lower compared to the similar events organized in Europe, yet it did not hinder the organization process at all. The invited speakers were hosted at a 5-star hotel very close to conference venue (paid by the organization), with free airport transfer for both ways. The rooms at the university guest house, which is quite new and modern, were offered to attendees for around 15 euros per room per night, with a very cheap breakfast option. Paid airport transfer were offered to all participants. For some participants coming from low income countries reduction in the registration fee and free rooms at the guest house were supplied upon their request/application.



For the coffee breaks we have agreed with one of the most popular coffee shop chains in the country (Arabica Coffee), who opened a stand at the workshop for filter coffee. Moreover, tea and cookies were offered at each coffee break, early in the morning before workshop and during long poster sessions. Free lunch with 4 course menu is given to all participants at the university cafeteria on both days. After the first day of the workshop a small tour is organized at the campus of Middle East Technical University (45 km2 area with 35km2 forest) with a technical trip to new wind tunnel testing facility of Aerospace Engineering Department.

After the visit at the labs a reception was given in front of the wind tunnel facility with beverages and snacks. Following the reception, the buses took the participants back to guest house and to conference dinner, which was organized at a local Turkish restaurant, during which presents were given to the invited lecturers. At the end of the meeting 200 Euro award was given to the best poster presentation.





After the workshop a social tour to Cappadocia was organized at the weekend for 2 days which is 3.5-4 hours' drive from Ankara. The tour included the transfer from Ankara, stay at a 5 star hotel, a private tour guide, the dinner and the Turkish night.



For special issue at Procedia Structural Integrity journal, we have received around 40 full paper submissions and after the review process 26 of them have been forwarded to Elsevier for publication. The review process was handled through Easychair conference management system and the registrations were taken through Eventbrite website. For the organizational and payment matters we have agreed with an organization company.

Overall everything went very smooth and according to the schedule. The organizers and the participants were quite satisfied from the event and the social activities. We are actually quite determined to go on with this organization every second year in the future.

Please check the website for the details and photos: <u>http://iwpdf.ae.metu.edu.tr</u>

Tuncay Yalcinkaya IWPDF 2019Chair



Advantages of being an ESIS member

- participation in TC activities and access to TC documents;
- full on-line access to ESIS procedures;
- full on-line access to former EGF-ESIS books;
- support for ESIS activity.

how to renew? see page 22 or <u>www.structuralintegrity.eu</u>

ESIS Website

www.structuralintegrity.eu

- become a member of ESIS and take advantage of all the "Members Only" resources on this Web site
- register automatically as a Member and pay the fee by PayPal system
- obtain your username and password for accessing the private area for downloading EGF-ESIS books and Procedures
- exchange new ideas, advancements and documents



CALENDAR OF TC MEETINGS & ACTIVITIES

тсв	January 23-24, 2020	ESIS Technical Meeting on Numerical Methods (TC8)	Munich, Germany	
тс4	April 1-3, 2020	TC4 Technical Committee Meeting	University of Twente, The Netherlands	
TC4	September 6-10, 2020	TC4 Meeting - 9 th International Conference on Fracture of Polymers, Composites and Adhesives	Les Diablerets, Switzerland	https://www.structuralinteg rity.eu/site/pdf/ESIS%2020 20 Flyer.pdf
TC15	September 8-10, 2021	TC15 Meeting - Second European Conference on Structural Integrity of Additively Manufactured Materials	Wien, Austria	

CALENDAR OF CONFERENCES & WORKSHOPS			
January 23, 2020	Workshop "Novel materials and engineering solutions for high temperature power generation plant"	University of Bristol, UK	https://www.fesi.org.uk/events/ novel-solutions-for-high- temperature-plants/
April 31, 2020	TAGSI/FESI Symposium 2020 "Structural Integrity Developments for a Competitive UK Nuclear Industry"	Granta Park, Cambridge, UK	www.twi-global.com/media-and- events/events-diary/tagsifesi- symposium-2020
June 27-28, 2020	7th Summer School on "Fracture Mechanics and Structural Integrity"	Funchal, Madeira, Portugal	https://www.ecf23.eu/
June 29–July 03, 2020	23 nd European Conference on Fracture - ECF23	Funchal, Madeira, Portugal	https://www.ecf23.eu/



Dear Colleague,

The 23rd European Conference on Fracture – ECF23 is scheduled from June 27 – July 3, 2020, on the beautiful Madeira Island, Portugal, *at <u>Hotel Casino Park</u>*.

SUMMER SCHOOL: A two-day event is offered to young researchers, with the world's leading experts in the field. 27th-28th June 2020 <u>https://www.ecf23.eu/summer-school/</u>



The Abstract submission deadline for ECF23 is approaching fast - February 1st

THIRTEEN SYMPOSIA are now available. Check the conference website for further details https://www.ecf23.eu/thematic-symposia/:

Also, the first ten plenary lectures are confirmed. More will be soon announced.

PUBLICATION

Special issues in Elsevier top journals: <u>Engineering Failure Analysis</u>, <u>Engineering Fracture</u> <u>Mechanics</u>, <u>International Journal of Fatigue</u>, and <u>Theoretical and Applied Fracture Mechanics</u> are available.

Also, a new journal is now available: <u>Journal of the Mechanical Behavior of Biomedical Materials</u> The entire set of proceedings will be published in <u>Procedia Structural Integrity</u>.

ESIS SUPPORT FOR RESEARCHERS

ESIS will support the active participation of scientists to ECF23 Conference by waiving the Conference fee for at least 40 delegates who require financial assistance to attend. Summer School fee will be paid by ESIS for those scientists who are awarded support. Also, additional support of up to 200€ will be considered.

For more details please check https://www.ecf23.eu/esis-support-for-researchers/

ABSTRACT SUBMISSION

For more details concerning abstract submission, registration and other information don't forget to check the conference website <u>www.ecf23.eu</u>

Don't forget to follow us on Twitter https://twitter.com/european_2020

Looking forward to meeting you in Madeira,



Pedro Moreira, INEGI, Portugal





Luis Reis, IST, Portugal

www.ecf23.eu







ESIS Procedures and Documents (free available for ESIS Members at www.structuralintegrity.eu)

Two kinds of documents are produced by ESIS Technical Committees with the following designatory system: ESIS P2-92 or ESIS P4-92D, where:

- P means "Procedure", and 2 and 4 are the current numbers, while 92 is the year of issue.
- D following the year (eg: 92D) means "draft", ie: not yet approved, while D prior to the year (eg: D1-92) means "Document" other than test methods. 2.
- 3.

P1-92

ESIS RECOMMENDATIONS FOR DETERMINING THE FRACTURE RESISTANCE OF DUCTILE MATERIALS. Responsible body: TC1 Subcommittee on Fracture Mechanics Testing Standards. P2-92 ESIS PROCEDURE FOR DETERMINING THE FRACTURE BEHAVIOUR OF MATERIALS. Responsible body: TC1 Subcommittee on Fracture Mechanics Testing Standards. P3-03D DRAFT UNIFIED PROCEDURE FOR DETERMINING THE FRACTURE BEHAVIOUR OF MATERIAL. Responsible body: TC1 Subcommittee on Fracture Mechanics Testing Standards (UNDER PREPARATION NOT AVAILABLE). P4-92D ESIS RECOMMENDATIONS FOR STRESS CORROSION TESTING USING PRE-CRACKED SPECIMENS. Responsible body: TC10 Committee on Environmental-Assisted Cracking. P5-00/VAMAS PROCEDURE FOR DETERMINING THE OF FRACTURE TOUGHNESS OF CERAMICS USING THE SEVNB METHOD. Responsible body: TC6 Committee on Ceramics. P6-98 ESIS PROCEDURE TO MEASURE AND CALCULATE MATERIAL PARAMETERS FOR THE LOCAL APPROACH TO FRACTURE USING NOTCHED TENSILE SPECIMENS. Responsible body: TC8 Committee on Numerical Methods. P7-00 ESIS PROCEDURE FOR DYNAMIC TENSILE TESTS Responsible body: TC5 Subcommittee on Dynamic Testing at Intermediate Strain rates. P8-99D ESIS DRAFT CODE OF PRACTICE FOR THE DETERMINATION AND INTERPRETATION OF CYCLIC STRESS-STRAIN DATA. Responsible body: TC11 Committee on High Temperature Mechanical Testing. P9-02D GUIDANCE ON LOCAL APPROACH OF RUPTURE OF METALLIC MATERIALS. (UNDER PREPARATION NOT AVAILABLE). P10-02 A CODE OF PRACTICE FOR CONDUCTING NOTCHED BAR CREEP RUPTURE TESTS AND INTERPRETING THE DATA. Responsible body: TC11 High Temperature Mechanical Testing Committee. P11-02 TECHNICAL RECOMMANDATIONS FOR THE EXTREME VALUE ANALYSIS OF DATA ON LARGE NONMETALLIC INCLUSIONS Responsible body: TC20 Committee on Inclusions. D1-92 FRACTURE CONTROL GUIDELINES FOR STRESS CORROSION CRACKING OF HIGH STRENGTH ALLOYS. Responsible body: TC10 Committee on Environmental Assisted Cracking. D2-99 FRACTURE TOUGHNESS OF CERAMICS USING THE SEVNB METHOD; ROUND ROBIN, TEST PROGRAMME. The ESIS TC6 and VAMAS TWA3 developed a test method and conducted a round robin for its validation. D2-99 presents a detailed documentation of this activity. The final form of the test method has appeared as P5-00. Responsible body: TC6 Committee on Ceramics.





2020 Membership Application Form 1ST JANUARY 2020 to 31ST DECEMBER 2020

European Structural Integrity Society

All members will be registered as Individual Members and will receive the ESIS Newsletter, at least once a year, by electronic delivery to the provided e-mail address.

Membership Fees should be paid either <u>by bank transfer</u> or <u>by Credit Card or by PayPal</u> to the value of \notin 30 (Euros).

Please put a cross (X) in the appropriate box(es):

Register me as an ESIS member for the year 2020 and send the ESIS Newsletters to the address stated below (in BLOCK CAPITALS please).

Payment details.

Since the membership fee is exceedingly cheap, <u>PLEASE REGARD THIS FORM AS AN OFFICIAL</u> <u>INVOICE</u>, noting that on receipt of your payment you will receive an official receipt plus your ESIS 2019 membership number.

OR

Enclosed is a PayPal payment receipt/details

Enclosed is a copy of bank transfer for € 30 (Euros The bank is: Uncredit banca The name of the beneficiary is: ESIS (European Structural Integrity Society) the coordinates are: IBAN: IT22 N 02008 01160 000020016279 BIC SWIFT Code: UNCRITM1AG0 OR Please charge to my (delete as appropriate) EUROCARD / MASTER CARD / VISA CARD / DINERS CARD / AMERICAN EXPRESS CARD an amount of € 30 (Euros). My card number is: Exp Date: Surname: Name Title(s) Please print clearly Affiliation: Address: Tel No: e-mail: Fax No: Signature: Please return this form to: ESIS Treasurer Date: Professor Giuseppe Ferro, Dept. For ESIS records purposes please give the numbers of the ESIS Technical of Structural Engineering, Committees in which you are most interested Politecnico di Torino, Corso Duca degli Abruzzi 24 Technical Committee(s): 10129 Torino, Italy or complete the web membership All ESIS Procedures and books are free for ESIS Members at form at www.structuralintegrity.eu www.structuralintegrity.eu