

**European Structural Integrity
Society****ESIS Newsletter #63, January, 2019**

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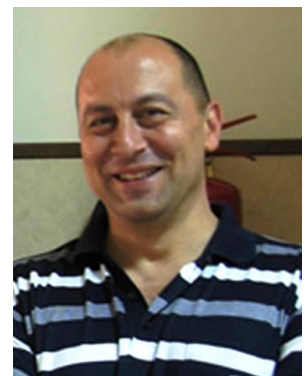
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**EDITORIAL BY THE ESIS
PRESIDENT**

Dear friends,

this is my first Editorial as ESIS President and, I must confess, it was really hard for me to prepare these few lines. There are, at least, two reasons for this difficulty.

First of all, I am not a "native" English writer. Yes, I am obviously able to write scientific papers, but an editorial is something different. So, please, forgive eventual mistakes!!



Secondly, it is really hard to be the "new President" after Leslie, a dear friend and a wonderful ESIS President, maybe the best one we have ever had. Just to remember some successes, during her presidency some great ECF conferences were organized, many Technical Committees were revitalized, some new National Groups joined (or joined again) ESIS, many special issues were published in the Elsevier journals affiliated with ESIS and a new publication media was activated, Procedia Structural Integrity. So, it will be very hard to keep the same level in the next four years, but I will do my best!

Anyway, in Belgrade I was really lucky: two really good friends that are really active in ESIS were elected as Vice Presidents: Aleksandar Sedmak, the organizer of the great ECF22 in Belgrade, and Liviu Marsavina from Romania. Their support and their enthusiasm will be crucial for a successful quadrennium!

As a first decision as the new ESIS President, I had to define the new Executive Committee. The former Ex-Co defined by Leslie was simply great... a 'band of friends' with only one goal: to do their best for ESIS. Well, as a new ESIS President, considering that a 'winning team should never be changed', I had a wonderful idea ... to ask all the former Ex-Co members to confirm their wish to be a member of the ESIS ExCo also for the quadrennium 2018-2022!! I think this is one of the best ideas I have ever had and, luckily, all of them confirmed their wish to offer their time to ESIS. So, the 'new team' is well experienced, with Bamber Blackman as Secretary, Giuseppe Ferro as Treasurer, Valery Shlyannikov (Newsletter and publications), Zhiliang Zhang (Liason) and Per Ståhle (Blog). This team has been reinforced by the next ECFs chairman, Pedro Moreira (ECF23), and, last but not least ... Leslie as the Past President. I think that the mix of experienced members and 'new blood' will allow this ExCo to obtain great results for ESIS!

As the new President, I have the privilege to congratulate Aleksandar for the organization of the ECF22. Thanks to his works, and to the great team he led, all the participants had the possibility to appreciate a great conference with so many interesting and high scientific quality presentations together with the warm hospitality of the Serbian people. A detailed report will be published in this Newsletter by Aleksandar, but 400 oral presentations, more than 100 posters and 372 papers for the Procedia Structural Integrity issue are not only numbers: they confirm the success of the event! On behalf of ESIS, I wish to acknowledge Aleksander for his time and for all his efforts!!

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). Only after three years since its foundations, already thirteen issues were published and, recently, the journal was accepted to be indexed in Scopus and in Web of Science.

The issues we published in 2018 are:

- Issue 8: AIAS2017 - 46th Conference on Stress Analysis and Mechanical Engineering Design, 6-9 September 2017, Pisa, Italy;

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/8/suppl/C>

- Issue 9: IGF Workshop "Fracture and Structural Integrity";

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/9/suppl/C>

- Issue 10: 1st International Conference of the Greek Society of Experimental Mechanics of Materials, Athens, May 10-12, 2018;

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/10/suppl/C>

- Issue 11: XIV International Conference On Building Pathology And Constructions Repair, Florence, Italy, June 20-22, 2018;

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/11/suppl/C>

- Issue 12: AIAS 2018 international conference on stress analysis;

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/12/suppl/C>

- Issue 13: ECF22 - Loading and Environmental effects on Structural Integrity

<https://www.sciencedirect.com/journal/procedia-structural-integrity/vol/13/suppl/C>

In order to encourage TCs and National Groups to take advantage of this option, ESIS will support part of the publication costs.

ESIS is publishing a YouTube channel with more than 500 subscribers with the video recordings of the presentations of the last ESIS

Summer Schools and ECF events.
(<http://www.youtube.com/c/EuropeanStructuralIntegritySociety>)

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 Aleksandar Sedmak. All the events are available in the ESIS Google calendar:

<https://calendar.google.com/calendar/embed?src=esisweb.org%40gmail.com&ctz=Europe%2FRome>

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:

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

- Google Drive:

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

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:

- For each Technical Committee, a shared Google Drive folder was activated. 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:

<http://www.structuralintegrity.eu/site/activity/tc-subscription>

How to share your papers in G Drive:

<https://drive.google.com/file/d/0B6daTFbjjZI5RG9VTnZMZzNfbkU/view?usp=sharing>

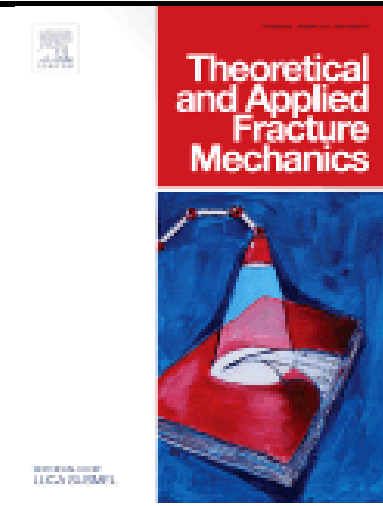
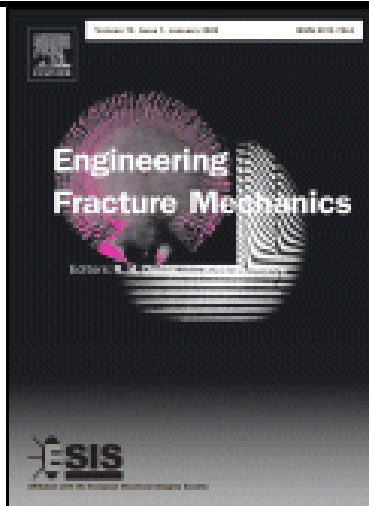
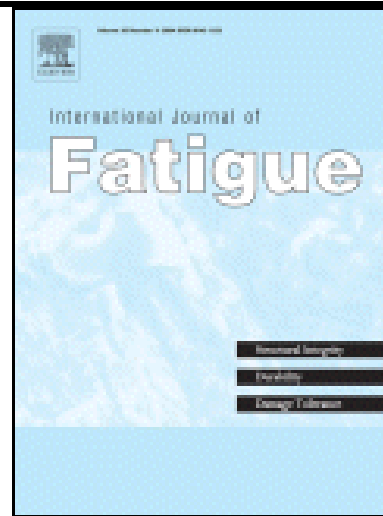
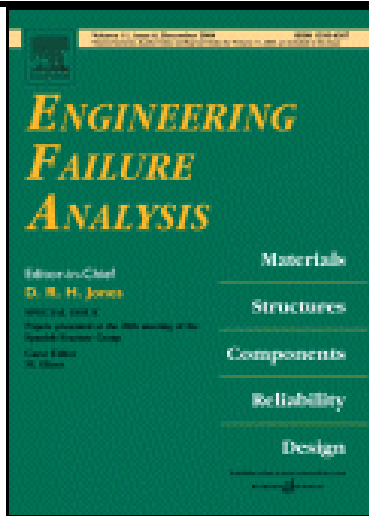
- In order to be always update about the activities organized by the ESIS Technical Committees of your interest, now the ESIS members can join the mailing lists managed directly by the TCs Chairmen. The procedure is really simple. The ESIS member has only to select the TC of his/her interest in the list 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 www.structuralintegrity.eu 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 ... in 2018, ESIS had 583 members from 27 countries.

I wish you all the best for 2019, hoping in your support for all the ESIS initiatives,

Francesco Iacoviello

4 Elsevier journals are affiliated with ESIS



Special Issues 2017-18

Journal	Title	Source	Editor	Status
Eng Fract Mech	Multiaxial Fracture 2016	11 th International Conference on Multiaxial Fatigue and Fracture (ICMFF11)	M.Endo, C.Navarro, M.Vormwald, A. Carpinteri	EFM 174, April 2017
Int J Fatigue	Multiaxial fatigue 2016: Experiments and modeling	11 th International Conference on Multiaxial Fatigue and Fracture (ICMFF11)	A.Carpinteri, A.Fatemi, Th.Palin-Luc, S.Vantadori	IJF 100, part 2, July 2017
Int J Fatigue	Special Issue on the 21 st European Conference on Fracture	ECF21	F. Iacoviello, D. Firrao, Th.Palin-Luc, M.Zimmermann	IJF 102, September 2017
Theor and Appl Fract Mech	Mixed Mode Fracture: Recent Developments	ECF21	F. Berto, M. Ayatollahi, L. Marsavina	TAFM 91, October 2017
Int J Fatigue	Special Issue on the 21 st European Conference on Fracture	ECF21	F. Iacoviello, D. Firrao, Th.Palin-Luc, M.Zimmermann	IJF 103, October 2017
Eng Fract Mech	Modern Imaging Techniques in Fracture and Damage Analyses	ECF21	A. Spagnoli, Y. Hong, G. Risitano, L. Susmel, Ph.Withers, V. Di Cocco	EFM 183, October 2017
Int J Fatigue	Special Issue on the 21 st European Conference on Fracture	ECF21	F. Iacoviello, D. Firrao, Th.Palin-Luc, M.Zimmermann	IJF 104, November 2017
Int J Fatigue	Special Issue on the 21 st European Conference on Fracture	ECF21	F. Iacoviello, D. Firrao, Th.Palin-Luc, M.Zimmermann	IJF 105, December 2017
Eng Failure Anal	21 st European Conference on Fracture	ECF21	L.Susmel, A.Carpinteri, D.G.Hattingh, Z.Bozic, D. Angelova	EFA 82, December 2017
Theor and Appl Fract Mech	21 st European Conference on Fracture in Catania (Italy) in 2016	ECF21	F. Iacoviello, G. Ferro, C. Ruggeri, V. Shlyannikov	TAFM 92, December 2017
Int J Fatigue	Special section on International Conference on Structural Integrity and Durability 2017, Fatigue of Materials and Structures at all Scales	ICSID 2017	Z. Božic, L. Banks-Sills, M. Vormwald, D.M. Frangopol	IJF 112-116, July, 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 113-117, August- December 2018
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

ECF 22 report

ECF22 was not just a conference for us, but rather a rare chance to present Serbian Society for Structural Integrity and Life (DIVK) and Serbia in the best way. It was also a big challenge for me personally, if not for all other aspects of such an event, then for my father's, Prof. Stojan Sedmak, legacy. Namely, it was him, whose gigantic efforts has positioned Serbia and ex-Yugoslavia high on the list of ESIS countries. In a way it was a simple task, standing on his shoulders, to achieve all these demanding goals.



Stojan Sedmak (1929-2014)

To start with, let me say that we have had extraordinary privilege to have Prof. James Rice with us. I am so much grateful for his fantastic lectures and his big effort to fly over the ocean back and forth, that I have no other words but LONG LIVE AND BE WELL, Jim!



James Rice during his introductory lecture

Then, let me praise the best ever ESIS president, Prof. Leslie Banks-Sills, for her support in many, if not all aspects of ECF22. Even though not being directly related to ECF22, let me remind you on just few results during her presidency: number of participants cca 350 (2010 in Dresden), cca 450 (2012 in Kazan, 550

(2014 in Trondheim), over 600 2016 in Catania, and finally 566 in Belgrade... 5 new TCs, 2 old revived, ExCo working like a dream team... I do believe ESIS is now one big family, with lot of potential to grow and contribute to the society by preventing fracture! The bar is now set very high for the new president, Prof. Francesco Iacoviello, but he will have all our help to jump over it...and to go back to ECF22, let me emphasize Francesco's help, which can't be overestimated!



Leslie Banks-Sills during opening ceremony, Francesco Iacoviello in the background



Opening ceremony



Aleksandar Sedmak & Leslie Sills-Banks after opening ceremony



**Greeting to new president
Francesco Iacoviello and new vice-president
Livi Marsavina**

Plenary lecturers delivered brilliant pieces of knowledge to very careful audience, so thank you James Rice, Youshi Hong, Jovo Jaric, Drazen Kozak, Meinhard Kuna, Nenad Gubelj, Robert Ritchie, Takayuki Kitamura, Yonggang Huang, Uwe Zerbst and William Curtin. Having full house on all occasions was such a reward to us, organizers. I will remember forever more than 500 people at the opening and standing ovation to praise Jim Rice and his unbeatable contribution to fracture mechanics. After delivering Woeller's medal to Paul Paris in Catania and **Griffith's medal** to **James Rice** in Belgrade, I am afraid we will have very difficult task in Madeira.



**Leslie Banks-Sills delivering Griffith's medal
to J. Rice**

Summers school also deserves full attention. We have put a lot of efforts to attract young people not only to ECF22, but also for the 5th ESIS Fracture Mechanics Summer School.

Indeed, it worked out, proved by 90 participants at the SS, and almost 200 at ECF22, making one of the results I am very much proud of. It was yet another legacy of my father, since it him who introduced in 1980 and organized in total ten International Fracture Summer Schools, the last one in 2008. My gratitude goes to John Landes, Francesco Iacoviello, Bamber Blackman and Leslie Banks-Sills for brilliant lecture, to Zijah Burzić, Srdja Perković, Blagoj Petrovski and Milorad Zrilić for Laboratory work, and once again, to Jim Rice, for probably the most memorable event during ECF22, the special lecture on the occasion of 50th anniversary of J integral.



**John Landes, supported by Nenad Gubelj,
during 5th ESIS Fracture Mechanics Summer
School**



**James Rice and his audience during 50th
anniversary lecture on J integral**

ESIS/Elsevier young researcher best paper award attracted less interest than anticipated, since we had only 8 candidates, but really strong candidates, all deserving to be mentioned: Aziz Tokgoz, Mor Mega, Yaroslav Khaburskyi, Anke Schmiedt, Que Zaiqing, Yaroslav Dubyk, Guian Qian, Junhe Lian. Coincidentally, the order of application was inverse to the order of awards: the winner is **Junhe Lian**, followed by **Guian Quin**, as the second one! This is probably the right moment to emphasize strong role of young researchers, not only because there contributed to ECF22 with almost 200 papers, but also because of high quality of papers and presentations.



Yet another, newly established award is to be mentioned. It is my great personal gratitude to Dr. Galip Buyukyildirim, who, on the behalf of the Turkish welding community, has introduced **the Award for the best weldment fracture mechanics paper, in memory of Prof. Stojan Sedmak. Fedor Fomin** is the winner on the occasion of ECF22, and I do hope this will become a tradition.



Award of Merit is well deserved by **Filippo Berto**, whose continues efforts and contribution to ESIS activities could not been overlooked. Let me also congratulate **new ESIS fellows**,

Zhiliang Zhang, Per Stahle, Valery Shlyannikov and Jacques Besson.



As the end of December approaches, 372 papers are ready for Procedia Structural Integrity, now indexed in Scopus, and 4 special

issues are on the way: Engineering Fracture Mechanics – “Hydrogen Embrittlement”, devoted to far the most successful mini-symposium, thanks to the extraordinary efforts of Prof. Milos Djukic, Engineering Failure Analysis - “Failure Analysis of Critical Engineering Components”, Theoretical and Applied Fracture Mechanics – “Advances in research of material, structural and environmental effects in Fracture Mechanics” and International Journal of Fatigue - “Fatigue from crack initiation to failure: role of defects and life assessment”

Last, but definitely not the least, let me name all those people who made this event successful and memorable one, far above my expectations (seven days, ever since the Summer School started, I have been waiting for some big blow to strike us, but it never happened, thanks to ECF22 co-chairs, Snezana Kirin, Marko Rakin and Zoran Radakovic), starting with my alter ego for this event, Branislav Djordjević, and then, in random order, Dragana Perović, Mihajlo Arandjelović, Simon Sedmak, Vuk Adžić, Miloš Milošević, Nenad Mitrović, Nikola Milovanović, Nenad Milosević, Milan Travica, Aleksa Milovanović, Emina Dzindo, Tea Sedmak, Jasmina Milenković, Ivana Cvetković, Jadranka Petrov, Milica Perić, Milica Paunović, Zorana Golubović... if I forgot somebody, let him/her forget me! Also, let me praise Igor Svetel for smoothly running web site, and all other external services provided in highly professional manner, starting from Metropol Palace staff, ABBA travel agency, tour guides and drivers, technicians...ending with excellent cultural programme, conference dinner music – thank you Sale, Tanja, Biljana, ansamble Perla..

Bless you all and hope you wish to come back to Serbia.

ECF 22 Conference Chairman,
Aleksandar Sedmak

National Committees

Hungary

2018:

Presentation of Prof. Y. Cho, Pusan National University, Korea, on “Ultrasonic guided wave NDE/SHM for inaccessible and invisible defects” at the Budapest University of Technology and Economics, February 5; attended by 30 people.

The event was jointly organized by the Structural Integrity Sub-committee of the

Scientific Committee on Materials Science and Engineering of Hungarian Academy of Sciences.

2019:

Workshop on NDT simulation in nuclear industry, Paks Nuclear Power Plant, Hungary, March.

Peter Trampus

Italy

An Italian Group of Fracture (IGF) workshop entitled *Fracture and Structural integrity: ten years of 'Frattura ed Integrità Strutturale'* was held in Cassino on June 4-6. The event was organized for the anniversary of the foundation of the IGF journal *Frattura ed Integrità Strutturale*, the International Journal of the Italian Group of Fracture. According to the IGF tradition, all the presentations were videorecorded and are freely available in the IGF YouTube channel. Proceedings were published in a dedicated issue of *Procedia Structural Integrity* and selected papers were published in extended version in a special issue of *Frattura ed Integrità Strutturale* (January 2019).



Plenary lecture: professor George Krauss
(School of Mines, USA)

In 2018, the IGF journal *Frattura ed Integrità Strutturale* published four issues as scheduled (January, April, July, October) with 86 papers and a rejection rate of about 60%.

In 2019, IGF will organize in Catania the *25th International Conference Fracture and Structural Integrity* (June 12-14, 2019) and the *Fracture Mechanics Summer School* (June 9-11, 2019). All the submitted papers, after being reviewed, will be published in an issue of *Procedia Structural Integrity*, the new *Procedia* published by Elsevier, recently indexed in Scopus. All the details are available in the event website: <https://www.igf25.it>.

Francesco Iacoviello

Portugal

Activities carried out in 2018

- General assembly of Portuguese national group (SPFIE), with the formation of the executive committee, 24th April, Covilhã, 2018
- General assembly of SPFIE, 12 December, Coimbra, 2018

Events support:

- XVI Portuguese Conference on Fracture, PCF 2018 – Covilhã, Portugal, 23 – 24th April, 2018 - <http://www.pcf2018.ubi.pt/>, Prof. Paulo Nobre Reis: preis@ubi.pt
- 18th International Conference on New Trends in Fatigue and Fracture – Lisbon, Portugal, July 17 – 20, 2018 - <http://nt2f.tecnico.ulisboa.pt/>, Prof. Luis Reis: luis.g.reis@tecnico.ulisboa.pt

Activities foreseen for 2019

- SPFIE Website publication www.spfie.pt

Support of:

- 3rd International Conference on Structural Integrity – ICSI – Madeira, Portugal, 2 – 5 September, 2019 - <http://www.icsi.pt/>, Prof. Pedro Moreira: pmoreira@inegi.up.pt

Also, since SPFIE is now active, the Portuguese ESIS national committee is now equivalent to SPFIE board members.

Luís Reis

Ukraine

Ukrainian National group of ESIS was arranged attracting ESIS members in participation in ECF22 in Belgrade. The special note about the event was published in the Journal “Physico-chemical Mechanics of Materials”, issue N5, 2018 (in Ukrainian).

The special activity of Ukrainian National group was devoted to a celebration of 100th Anniversary of the National Academy of Sciences of Ukraine. The special note about the event was published in ESIS Newsletter, issue N62, 2018. The main attention was paid to collaboration between ESIS and Academy.

Ukrainian National group is organizing the 6th International Conference “Fracture Mechanics of Materials and Structural Integrity” under ESIS auspice. The conference will be held in Lviv, Ukraine, 03-06 of June, 2019 (<http://fmsi2019.ipm.lviv.ua>).

Hryhoriy Nykyforchyn

UK

A summary from 2018 and intentions for 2019 in the UK:

2018:

- Joint TAGSI/FESI Symposium on “Structural Integrity and Materials in Nuclear Power Plants – In memory of Prof John Knott OBE TRS, FREng”, TWI Cambridge – 18 April 2018.
- Joint The Welding Institute Structural Integrity Technical Group/FESI Seminar on “Constraint Effects on Fracture”, TWI Cambridge – 25 July 2018.
- Joint Engineering Integrity Society (EIS)/FESI Seminar on “Engineering Integrity of Structures and Components Subjected to Degradation Mechanisms”, Cranfield University – 11 September 2018.
- Joint IMechE/FESI Seminar on “Application of Probabilistic Structural Integrity – Methods and Benefits for Nuclear Asset, Design, Operation and Decommissioning”, IMechE HQ, London – 10 October 2018.
- Also in 2018 we launched the new FESI Website.

2019

Two following activities will definitely go ahead, supported by FESI

Beyond Code Safety Requirements for Nuclear Pressure Systems	10 April 2019
The 15 th International Conference on Engineering Structural Integrity Assessment (ESIA15), in conjunction with the 2019 International Symposium on Structural Integrity (ISSI-2019), China	8-9 May 2019

David Knowles

TECHNICAL COMMITTEES

TC2: Micromechanisms

In April 2018 the previous chair (**Prof Jaroslav Pokluda**) and co-chair (**Prof Otmar Kolednik**) stepped down after the election of the new chair (**Prof Andrey Jivkov**) and co-chair (**Dr Andrey Shanyavskiy**). During the year TC2 had no special meetings, apart from a meeting between old and new chairs during ECF22 in Belgrade in August 2018. The next TC2 meeting will be held in the form of a mini-symposium during the 9th International Conference on Materials Structure and Micromechanics of Fracture, to be held June 26-28 2019 in Brno, Czechia. We anticipate sufficient number of attendants to organise a special issue of EFM from this meeting.

Topic and Program

ESIS TC2 meetings cover all micromechanisms of fatigue and fracture of materials and components.

Meeting Chairs

Prof. Andrey Jivkov (University of Manchester, UK)

Prof. Jaroslav Pokluda (Brno University of Technology, CZ)

Location



TC-2 meeting will take place at the Faculty of Mechanical Engineering, Brno University of Technology, Technická 2, Brno-Žabovřesky, Czech Republic. Brno lies in the central part of Europe, in the Czech Republic; it is the second largest city in the country (nearly 400 000 inhabitants). It is the centre of the province of Moravia, one of the historic lands of the Czech Crown. Brno is situated in a picturesque countryside (190 - 425 m above sea level), surrounded on three sides by wooded hills and opening to the Southern Moravian lowlands. Geographically, Brno is part of the Danube Basin and has many historical ties to the Austrian capital Vienna, which lies a mere 110 km to the

south. Brno enjoys a very pleasant, moderate climate, ideal for recreation and everyday living.

Please, see the webpage <http://tc2.fme.vutbr.cz/meeting12/> for more information.

*Andrey Jivkov
Jaroslav Pokluda*

TC3: Fatigue of Engineering Materials And Structures

Statutes and activities of ESIS Technical Committee No.3 (TC3) - December 2018

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 Theoretical and Applied Fracture Mechanics** entitled "**Crack Paths 2018**" (Guest Editors: Andrea Carpinteri, Francesco Iacoviello, Les Pook, Sabrina Vantadori), with papers selected from those presented at the 6th International Conference on Crack Paths (CP 2018), held in Verona, Italy, 19th to 21st September, 2018.

(c) **Special Issue of International Journal of Fatigue** entitled "**Fatigue Crack Paths 2018**" (Guest Editors: Andrea Carpinteri, Filippo Berto, Youshi Hong, Thierry Palin-Luc), with papers selected from those presented at the 6th International Conference on Crack Paths (CP 2018), held in Verona, Italy, 19th to 21st September, 2018.

(d) **12th International Conference on Multiaxial Fatigue and Fracture (ICMFF12)**, to be held in Bordeaux, France, 24th to 26th June, 2019. Chairpersons: Thierry Palin-Luc (Talence, France), Franck Morel (Angers, France), and Andrea Carpinteri (Parma, Italy).

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) **Special Issue of the Journal 'Frattura ed Integrità Strutturale'** focussed on 'Frature and Structural Integrity: ten years of Frattura ed Integrità Strutturale' (Guest Editors: Vittorio Di Cocco, Carmine Maletta, Giacomo Risitano, Andrea Spagnoli), January 2019, Vol.13, No.47.

(c) **TC1/TC3 Mini Symposium on 'Defects and Fatigue'** at the European Conference on Fracture 2018 (ECF 22) 26 - 31 August, 2018, Belgrade, Serbia, <http://www.ecf22.rs/>

(d) **6th International Conference on 'Crack Paths' (CP 2018)**, held in Verona, Italy, 19th to 21th September, 2018. Chairpersons: Filippo Berto (Trondheim, Norway), Andrea Carpinteri (Parma, Italy), Youshi Hong (Beijing, China), Les P. Pook (Sevenoaks, UK), and Sabrina Vantadori (Parma, Italy).

*Andrea Carpinteri
Les P. Pook*

TC10: Environmentally Assisted Cracking

ESIS TC10 "Environmentally Assisted Cracking" was focused on cooperation and consolidation of efforts in seeking of solutions to complex problems related to gas and oil pipeline integrity. In 2018 young scientist Ivan Shtoyko from Karpenko Physico-Mechanical Institute (Lviv, Ukraine) passed training in Salamanca University (Spain) under leadership of Professor Jesus Toribio within the scope of modelling of fatigue crack growth in pipeline steels with taking into account the effect of hydrogen diffusion in the damaging scenario. Several papers devoted to fracture problems in pipelines were presented by TC10 members at the ECF22 in Belgrade.

TC10 takes part in organization of the 6th International Conference "Fracture Mechanics of Materials and Structural Integrity" under ESIS auspice. The conference will be held in Lviv, Ukraine, 03-06 of June, 2019 (<http://fmsi2019.ipm.lviv.ua>). It is expected that the problem of environmentally assisted fracture will be one of the most important, considered at the Conference. TC10 meeting is scheduled to be held during the Conference.

*Jesús Toribio
Hryhoriy Nykyforchyn*

TC11: High Temperature Mechanical Testing

Annual Activity report			
Year	2018		
Co-Chairs	Dr.-Ing. Hellmuth Klingelhöffer (Chairman) [BAM] Lawrence Candler (Vice Chairman)		
Secretary	Malcolm Loveday [HTMTC, UK]		
Meetings	Date	Location	Attendance
	2018-04-18	NPL, Teddington, UK	15 persons
	2018-11-18	Instron, High Wycombe, UK	15 persons
	2019-04-11	Nottingham Univ., Nottingham, UK	
Long term drift measurements on type N thermo couples	Drift data of thermo couples are quite rare but have big impact in industrial applications. Therefore, long term drift data are generated and continued by two partners.		
New/ Proposed Round Robin Activities	-		
New/ Proposed Collaborative activities	Organization of the 4 th Int. Workshop on Thermo-Mechanical Fatigue, 13-15 Nov 2019, BAM, Berlin, Germany. Participation in organizing the ECCC2020 Creep Conference in Edinburgh, Scotland, UK		
Publications and Dissemination Activities	Activities are disseminated via the HTMTC Website: www.htmtc.net		
Status of Standardization Projects	Several committee members supply input to many standards which are annually discussed in national mirror committees and on the ISO TC 164 conference in Stockholm, September 2018		

Subcommittees details and activities	Working Group: Temperature Measurement (long term drift measurements of type N thermo couples) & preparation of Code of Practice for Temperature Measurement in High Temperature Mechanical Testing.
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Hellmuth Klingelhöffer

TC13: Education and Training

Agenda of the Summer Schools on Fracture Mechanics

Year	Venue	Organizer	Chairs	Date	Participants / Countries
2014	Trondheim Norway	ECF20	Prof. Z. ZHANG	1st Summer School June, 28 - 29	60/20
2015	Ternopil, Ukraine	TC13	Prof. Petro YASNIY	2nd Summer School September, 24-25	36/4
2016	Catania, Italy	ECF21	Prof. Francesco IACOVIELLO	3rd Summer School June, 18 - 19	87/18
2017	Dubrovnik, Croatia	TC13	Prof. Željko Božić	4th Summer School, August, 14-15	36/21
2018	Beograd, Serbia	ECF22	Prof. Aleksandar SEDMAK	5th Summer School August, 26th-27th	90/20
2019	Crakow, Poland	TC13	Prof. Jaroslaw GALKEWICH	7th Summer School September, 13-15 http://summerschool2019.tu.kielce.pl/	
2020	Funchal, Portugal	ECF23	Dr. Pedro MOREIRA, Prof. Luis REIS	8th Summer School	

Minutes of the Meeting of the ESIS Technical Committee No13 "Education and Training" (June 22, 2016, Catania, Italy)

The meeting of the **ESIS Technical Committee TC13** was held on August 30, 2018 at the ECF22 in Belgrad, Serbia. The ESIS President Prof. Francesco Iacoviello, Vice-Presidents Prof. Aleksandar Sedmak (Serbia)

and Prof. Liviu Marsavina (Romania), Ex-President of ESIS Prof. Leslie Banks-Sills, TC13 co-chairmen Prof. Petro Yasniy and Prof. Hryhoriy Nykyforchyn (Ukraine) attended the meeting. Also Prof. Jesus Toribio (Spain), Prof. Filippo Berto (Norway), Prof. Zeljko Bozic (Croatia), Prof. Nenad Gubeliak (Slovenia), Dr. Jaroslav Galkiewicz (Poland), Prof. Siegfried Zchmauder (Germany), Prof. Peter Trampus (Hungary) and others were participated in the Meeting. Totally, 24 participants took part in the in the Meeting. Prof. Petro Yasniy and Prof. Aleksandar Sedmak chaired the Meeting. Important problems of the Committee activity were discussed. Prof. Aleksandar Sedmak and Prof. Željko Božić (Croatia) reported on the experience in the management and organization of Summer Schools on Fracture Mechanics for the young scientists in Serbia and Dubrovnic (Croatia) in 2017.



Sitting of the Technical Committee TC13: to the left: Prof. Petro Yasniy (Prof. A. Sedmak – Chairman); to the right: Prof. Jesus Toribio (Spain), Dr. Jaroslav Galkiewicz (Poland) and Prof. Francesco Iacoviello.

Two papers were presented at the meeting:

- Aleksandar Sedmak, Blagoj Petrovski, Vencislav Grabulov, Fracture Mechanics Summer Schools in exYu and Serbia 1980-2008
- Liviu Marsavina, Raluca Pepelan, Ion Octavian Pop, Mark tracking technique for experimental determination of fracture parameters



Participants of the Technical Committee TC13 Meeting

The main activity of the Committee was focused on the organization of Summer Schools

for young scientists. It was mentioned, that the 1-st, 3-rd and 5-th Summer Schools were held in the framework of the European Conferences on Fracture ECF20 (Trondheim, Norway – 2014), ECF21 (Catania, Italy – 2016) and ECF22 (Beograd, Croatia – 2018). The 2-nd and the 4-th Summer Schools were held in Ternopil (Ukraine) in 2015 and in Dubrovnic (Croatia) in 2017, correspondingly. Being preliminary conformed the following Summer Schools will be supported by ESIS and will be held in Cracow (Poland – 2019) – the 6-th, and in Funchal (Portugal – 2020) – the 7-th.

Finally, Prof. Y. Galkewich presented the Program and the Provisional budget of the 6-th Summer School being held at the Mining-Metallurgical Academy of Cracow. The contributions to the discussion were made by Prof. Francesco Iacoviello, Prof. Liviu Marsavina (Romania), Prof. Hryhoriy Nykyforchyn (Ukraine) and Prof. Jesus Toribio (Spain).

*Petro Yasniy
Liviu Marsavina*

- Stent design;
- Stent manufacturing;
- Stent failure and fracture;
- In-vitro and in-vivo studies;
- Biocompatibility of stents;
- Stent-vessel interaction;
- Fluid-solid interaction;
- In-stent restenosis;
- Biological and clinical issues related to stents;
- Stent deployment and delivery;
- Medical-imaging-based assessment.

Special Session “**Design, Manufacturing and Evaluation of Shape-Memory Alloy Stents**” will be organised within the framework of this conference.

The papers presented at this Conference will be published in a Special Issue of **Procedia Structural Integrity**.

More information is available at <http://moamrq.co.uk/ICS3M2019>.

Vadim V. Silberschmidt

TC14: Integrity of Biomedical and Biological Materials

TC 14 will organise the **International Conference on Stents: Materials, Mechanics and Manufacturing** on 15-17 July 2019 in London, UK. The Conference will be held at Loughborough University London campus, located inside *Here East*, an inspiring innovation hub in the Queen Elizabeth Olympic Park.

Two keynote lectures:

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

The aim of this Conference is to bring together specialists in biomedical engineering, biomechanics, materials science, experimental mechanics, modelling and various aspects of processing and manufacturing as well as medical practitioners to discuss advances in stent technologies.

The topics of the Conference include, but are not limited to, the following:

- Metallic and polymeric materials for stents;
- Mechanical properties of stents;
- Development of biodegradable stents;
- Modelling and simulations of stent deformation;

TC15: Structural Integrity of Additively Manufactured Components

ESIAM19

The First European Conference on Structural Integrity of Additively Manufactured Materials (ESIAM19) is hosted at Clarion Hotel & Congress in **Trondheim, Norway, 9 - 10 - 11 September 2019. Welcome to ESIAM19** www.esiam.eu

Call for abstract is open for ESIAM 2019 <https://www.esiam.eu/abstract-submission/>

Abstract Deadline 31 December 2018

Aim. 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 will provide an overview over current scientific knowledge and stimulate ideas for future research directions in this emerging field. Peer-reviewed contributions will be in the form of a 20-minute presentation or a poster. The agenda will allow for extended discussions and for exploring Trondheim in one of the most pleasant times of the year. ESIAM19 will be the opening event for a yearly international conference series held alternating in Europe and worldwide.

Background. Additive manufacturing (AM) techniques offer the potential to economically fabricate customized parts with complex geometries in a rapid design-to-manufacture cycle. Before benefits can be explored in critical load bearing applications, the basic understanding of the mechanical and functional behavior of these materials must be substantially improved at all scales. In particular, a better understanding of fracture and fatigue performance is key. The conference will shed light on the basic physical phenomena of fatigue and fracture of AM materials and develop effective criteria for the design of unprecedented high performing components for next generation automotive, aerospace and biomedical applications.

Conference Papers. Peer reviewed publications from conference contributions and discussions will appear in the proceeding of the conference. Extended versions of selected papers will be invited for Special Issues in ESIS affiliated journals.

Dedicated Section in IGF25

A special section dedicated to TC15 is planned during 25th International Conference - Fracture and Structural Integrity June 12-14, 2019 www.igf25.it

*Filippo Berto
Luca Susmel*

ESIS TC16: Finite Fracture Mechanics

In 2018 we had the first TC16 meeting at La Thuille in North of Italy: **TC16 – Finite Fracture Mechanics Workshop I (13-14 April, 2018)**. This was a very enjoyable and fruitful meeting.

Participants

- Prof. Pietro Cornetti
- Prof. Vittorio Di Cocco
- Mr. Aurélien Doitrand
- Prof. Dominique Leguillon
- Prof. Vladislav Mantic
- Prof. Eric Martin
- Mr. Philipp Rosendahl
- Prof. Jens Schneider
- Dr. Philipp Weissgraeber
- Prof. Zohar Yosibash
- Prof. Joseph Yost



At the workshop dinner

We already planned the second TC16 workshop to be held in Grenoble, France during 27-29 March 2019.

Zohar Yosibash

TC17: Non Destructive Evaluation

2018:

Kick off meeting was held during ECF 22 in Belgrade, August 29, attended by 8 people. Meeting participants agreed upon the importance of non-destructive evaluation (NDE) within the structural integrity assessment scheme, and supported the overall concept and the major objectives of TC 17. There were some suggestions to extend the scope such as (i) monitoring methods should also be involved, (ii) NDE methods/techniques should not be excluded and (iii) a document with the subject keywords should be placed on ESIS website. Future TC 17 events were also discussed.

2019:

Thematic symposium on “NDE methods and techniques serving structural integrity assessment” will be held in the framework of ICSI 2019, Madeira, Portugal. Details are in conference website: <http://www.icsi.pt/thematic-symposia/>.

TC17 & TC24 Joint Conference on “NDE in railway industry” (tentative title) to be held in Hungary, October is under negotiation/preparation.

Peter Trampus

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 19** or
www.structuralintegrity.eu

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

TC8	January 17-18, 2019	ESIS TC8 Technical Meeting On Numerical Methods	Cassino, Italy	http://www.cdmunicas.it/ESIS-TC8/
TC2	June 26-28, 2019	12 th Meeting of the TC2 on Micromechanisms	Brno, Czech Republic	http://tc2.fme.vutbr.cz/meeting12/
TC12	July 1-2, 2019	TC12 Annual Meeting The First International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS 2019)	Porto, Portugal	https://drive.google.com/file/d/1vq7GlXuPqDGxcw1caXMgTpqAOTJ5ou2Q/view
TC14	July 15-17, 2019	TC14 Meeting International Conference on Stents: Materials, Mechanics and Manufacturing	London, UK	http://moamrq.co.uk/ICS3M2019
TC15	September 4-6, 2019	First European Conference Structural Integrity of Additively Manufactured Materials	Trondheim (Norway)	https://www.esiam.eu/

CALENDAR OF CONFERENCES & WORKSHOPS

May 15-17, 2019	19th International ASTM/ESIS Symposium on Fatigue and Fracture Mechanics (42nd National Symposium on Fatigue and Fracture Mechanics)	Denver, CO	http://www.astm.org/ASTM-ESISCFP2019 .
July 15-17, 2019	International Conference on Stents: Materials, Mechanics and Manufacturing	London, UK	http://moamrq.co.uk/ICS3M2019
September 13-15, 2019	6th Summer School on Fracture Mechanics	Cracow, Poland	http://summerschool2019.tu.kielce.pl/

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:

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

<p>P1-92 ESIS RECOMMENDATIONS FOR DETERMINING THE FRACTURE RESISTANCE OF DUCTILE MATERIALS. Responsible body: TC1 Subcommittee on Fracture Mechanics Testing Standards.</p>
<p>P2-92 ESIS PROCEDURE FOR DETERMINING THE FRACTURE BEHAVIOUR OF MATERIALS. Responsible body: TC1 Subcommittee on Fracture Mechanics Testing Standards.</p>
<p>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).</p>
<p>P4-92D ESIS RECOMMENDATIONS FOR STRESS CORROSION TESTING USING PRE-CRACKED SPECIMENS. Responsible body: TC10 Committee on Environmental-Assisted Cracking.</p>
<p>P5-00/VAMAS PROCEDURE FOR DETERMINING THE OF FRACTURE TOUGHNESS OF CERAMICS USING THE SEVNB METHOD . Responsible body: TC6 Committee on Ceramics.</p>
<p>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.</p>
<p>P7-00 ESIS PROCEDURE FOR DYNAMIC TENSILE TESTS Responsible body: TC5 Subcommittee on Dynamic Testing at Intermediate Strain rates.</p>
<p>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.</p>
<p>P9-02D GUIDANCE ON LOCAL APPROACH OF RUPTURE OF METALLIC MATERIALS. (UNDER PREPARATION NOT AVAILABLE).</p>
<p>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.</p>
<p>P11-02 TECHNICAL RECOMMANDATIONS FOR THE EXTREME VALUE ANALYSIS OF DATA ON LARGE NONMETALLIC INCLUSIONS Responsible body: TC20 Committee on Inclusions.</p>
<p>D1-92 FRACTURE CONTROL GUIDELINES FOR STRESS CORROSION CRACKING OF HIGH STRENGTH ALLOYS. Responsible body: TC10 Committee on Environmental Assisted Cracking.</p>
<p>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.</p>

