

Colloquium on Fatigue Mechanisms

23 – 24 April 2024,

Brno, Czech Republic

Final program



**Institute of Physics of Materials
Czech Academy of Sciences**

Address: Žižkova 513/22, 616 00 Brno, Czech Republic

Tuesday, 23 April 2024

8:00 - 9:00 Registration

9:00 - 9:15 Welcome speech
Kruml T., director of IPM

Session 1.1 chair: Michael Zehetbauer

9:15 - 9:45 Influence of wire and arc additive manufacturing process parameters on the fatigue life of Ti-64 (FL)
Höppel H. W., Elitzer D., Meermeier A.

9:45 - 10:15 Cyclic behaviour of a metastable austenitic steel fabricated by laser powder bed fusion (FL)
Šmíd M., Jambor M., Koutný D., Neumannová K., Čapek J., Polatidis E.

10:15 - 10:35 Fatigue behaviour of cp-Ti scaffolds with material micro-porosity fabricated by direct ink writing (SC)
Slámečka K., Kashimbetova A., Tkachenko S., Gejdoš P., Pokluda J., Montufar E. B., Čelko L.

10:35 - 10:55 Novel additive manufacturing material Printdur HSA (SC)
Blankenhagen J., Radlbeck Ch., Mensinger M.

10:55 - 11:20 Coffee break

Session 1.2 chair: Jaroslav Polák

11:20 - 11:50 Fatigue properties of biodegradable MgZn alloy processed by SPD (FL)
Zehetbauer M., Hartleb M., Khatibi G., Ojdanic A., Lederer M., Schafler E.

11:50 - 12:20 Damage tolerant fatigue behavior of laminated metallic composites with dissimilar yield strength (FL)
Vollath S., Pohl P. M., Höppel H. W., Göken M.

12:20 - 12:40 The influence of loading mode on fatigue properties of AZ91 alloy processed by SPD method (SC)
Štěpánek R., Pantělejev L., Fintová S., Guagliano M., Kunz L.

12:40 - 13:00 Critical length of shear-mode cracks emanating from notches (SC)
Horníková J., Šandera P., Žák S., Pokluda J.

13:00 - 14:00 Lunch

Session 1.3 chair: Jaroslav Pokluda

14:00 - 14:30 Cyclic Loading-Unloading-Reloading (LUR) experiments as a valuable characterization method to quantify microplasticity and co-deformation (FL)
Kuglstatter M., Pohl P. M., Höppel H. W.

14:30 - 15:00 Molecular dynamics simulations of cyclic crack propagation in FCC metals. Load, SFE, temperature and loading mode effects. (FL)
Sauzay M., Awi E., Brutzel L., Duparc O. H.

15:00 - 15:30 Contribution of the localization of the cyclic plastic strain in the initiation and growth of fatigue cracks (FL)
Polák J., Vražina T., Babinský T., Chlupová A., Kruml T.

15:30 - 15:50 Cyclic plasticity, fatigue and microstructural aspects - the case of equiatomic CrCoNi multi-principal element alloy (SC)
Heczko M., Mazánová V., Slone C. E., Gröger R., George E. P., Dlouhý A., Kruml T., Polák J., Mills M. J.

15:50 - 16:20 Coffee break

Session 1.4 chair: Anja Weidner

16:20 -	16:50	Orientation-dependent deformation mechanisms of near-threshold crack growth in a highly textured magnesium alloy <u>Schöne S.</u> , Brückner-Foit A., Zimmermann M., Rienäcker A.	(FL)
16:50 -	17:20	Measurement of stress intensity factors by means of digital image correlation <u>Wolf C. H.</u> , Henkel S., Biermann H.	(FL)
17:20 -	17:40	On the relevance of material properties considered in fatigue crack closure studies <u>Vojtek T.</u> , Kubíček R., Jambor M., Pokorný P., Náhlík L., Pokluda J., Hutař P.	(SC)
17:40 -	18:00	Improved fatigue properties of aluminum casting alloys through optimization of casting defects and pores <u>Kreins M.</u> , Hippe M., Krupp U.	(SC)

20:00 - 23:00 Colloquium dinner

The colloquium dinner will be held in the Hotel Continental, Kounicova 680/6, Brno

<https://www.continentalbrno.cz/en>

Wednesday, 24 April 2024

Session 2.1 chair: Stefanie Tschegg

- 9:00 - 9:30 Influence of proeutectoid ferrite on the very high cycle fatigue (FL) properties of pearlitic steel
Schönbauer B. M., Sistaninia M., Maierhofer J., Spalek A., Gänser H-P., Bucher Ch., Pippan R., Mayer H.
- 9:30 - 10:00 Monitoring of ultrasonic fatigue testing with acoustic emission (FL)
Selenzev M., Weidner A., Biermann H., Vinogradov A.
- 10:00 - 10:20 Fatigue lifetime predictions of notched specimens based on the critical distance and stress concentration factors (SC)
Klusák J., Kozáková K.
- 10:20 - 10:40 Ultrasonic fatigue testing of short-fiber reinforced PEEK (SC)
Fitzka M., Stadler G., Schönbauer B., Mayer H., Pinter G.
- 10:40 - 11:00 Gigacycle Fatigue of High Strength Steels (SC)
Nový F., Trško L., Šikyňa L.

11:00 - 11:20 Coffee break

Session 2.2 chair: Heinz Werner Höppel

- 11:20 - 11:40 On the fatigue behavior of differently deep rolled conditions (SC) of SAE 1045 in the very-high-cycle fatigue regime
Krochmal M., Saalfeld S., Wegener T., Scholtes B., Niendorf T.
- 11:40 - 12:00 The influence of water cooling on selected mechanical (SC) properties of AA7075-T651 FSW joints
Kosturek R., Śniezek L., Torzewski J.
- 12:00 - 12:20 Influence of a cold formed and a machined notch on the (SC) fatigue properties of a stainless steel
Nitzsche P., Hauser M., Wendler M., Szlosarek R., Volkova O., Henkel S., Weidner A., Biermann H.

12:20 - 12:40	Thermomechanical fatigue of nickel-based superalloy <u>Šulák I.</u> , ObRTLík K.	(SC)
12:40 - 13:00	Evaluating the fatigue strength of shot peened Al alloys by experimental and analytical approaches <u>Oranli E.</u> , Bagherifard S., Guagliano M.	(SC)
13:00 - 13:10	Closing remarks	

Colloquium contributions:

Full length (FL): 25 min presentation + 5 min discussion

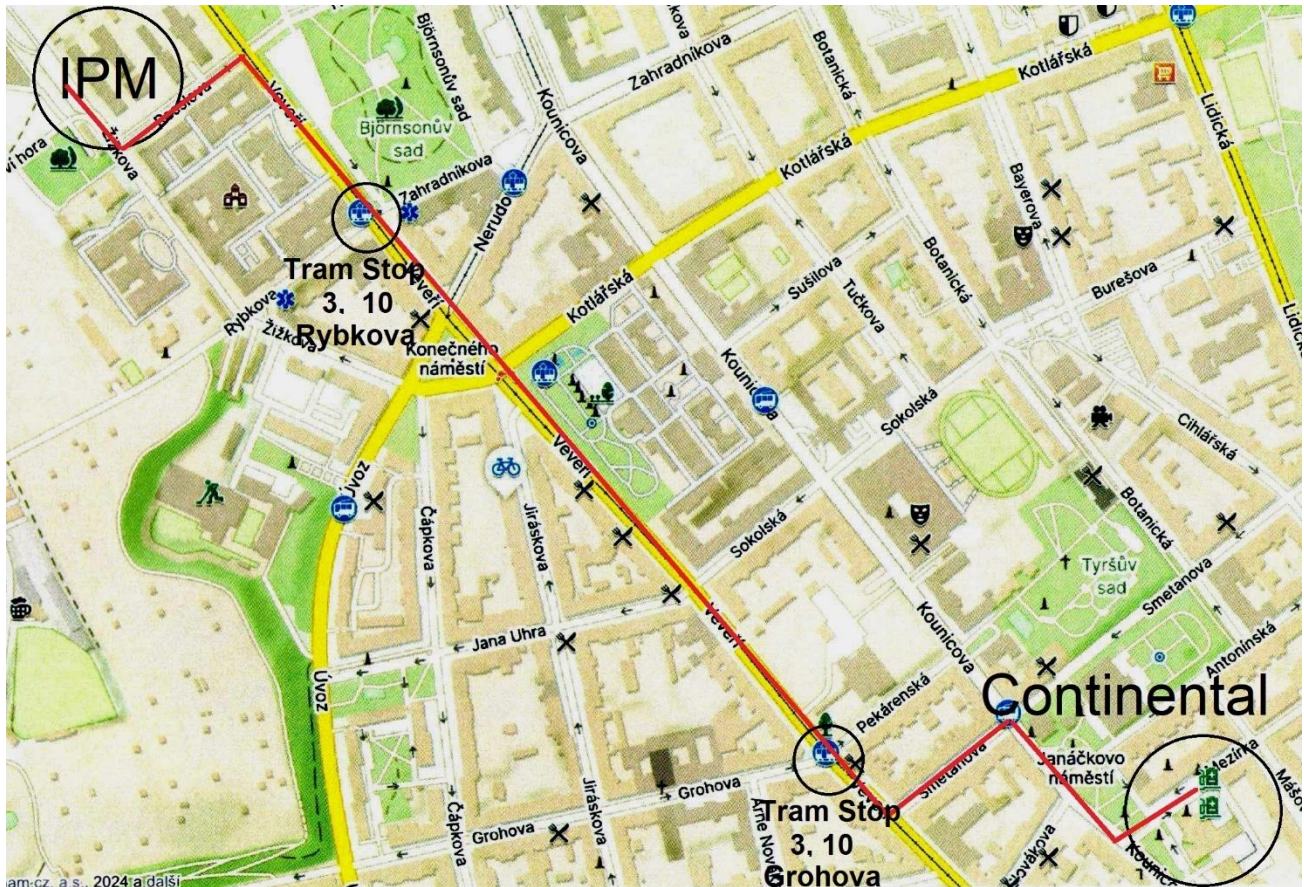
Short contribution (SC): 15 min presentation + 5 min discussion

Colloquium venue:

**Institute of Physics of Materials (IPM), Czech Academy of Sciences,
Žižkova 22,
616 00 Brno,
Czech Republic
Lecture hall (4th floor)**

**Parking of cars is possible inside of IPM, GPS: 49.2073831N 16.5896503E
(please ask for parking at the IPM reception).**





From the Continental Hotel you can

a) walk to the IPM in 20 minutes (cca 1.5 km) along the red marked route

b) take tram 3 or 10 (from the Grohova to Rybkova tram stop).

On public transport, you can pay directly in the car with payment cards (VISA, MASTER) by tapping them to the terminal (More info: Beep and Go, contactless ticket purchase: <https://pipniajed.cz/en.html>).