ICONHIC 2022

PREP VIRTUAL WORKSHOP SCHEDULE

22-23 JUNE 2021

www.iconhic.com/2021

Foreword

#resilience #sustainability #natural #disasters #infrastructure

After passionately organizing the two first conferences in Crete, Greece (summer 2016 & summer 2019) and experiencing a -quite frankly- overwhelming support by the contributors and participants, ICONHIC is more than ever committed to delivering top-notch content on Natural Disasters and Infrastructure, bringing all contributors of the Natural Hazard Risk Management community under the same roof. Despite the ongoing distress and disruption caused by the Covid-19 pandemic, the increased frequency and intensity of unceasing natural hazards require vigilance and cooperative action. In view of that, and following the requests of several participants, the ICONHIC Organizing Committee, in close coordination with the Steering and Scientific Committees, has decided to host a small-scale Virtual Preparatory Workshop this summer, paving the way for the core ICONHIC2022 event.

The overarching objective of the Virtual Preparatory Event is to warm up the conference audience prior to the in-person event in 2022 and connect academics, industry experts, and professionals during turbulent times and traveling uncertainty caused by the pandemic. We are also looking to kick-start the discussion better sooner than later, and exchange state-of-the-art ideas, from concept to implementation level. It is really important to all of us in ICONHIC to be on top of the latest advancements in the interplay between natural disasters and infrastructure, so that we can serve the ever-growing needs of humanity for resilient and sustainable solutions to the best of our capacity. The preparatory workshop will be delivered in the form of a 100% 2-day virtual event, featuring a limited series of Special Sessions and Introductory Keynote Talks.

> We believe that a virtual workshop is the right way to help organize a more inclusive and engaging in-person event in 2022, and are excited to be welcoming you all in our virtual portal!

Tuesday's Schedule at a glance

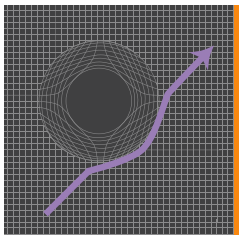
14:00 - 21:00

EEST | UTC +3 | EDT +7

22 June

WELCOME TALK
G. Gazetas, NTUA, GREECE
I. Anastasopoulos, ETH Zurich, SWITZERLAND
R. Kourkoulis, ICONHIC, GREECE

14:00



SPECIAL SESSION
Innovative Ground Interventions & Metamaterial Concepts for Structure Protection

PART 1

Organisers
E. Chatzi
A. Marzani
I. Antoniadis

14:15

15:50

10 min. BREAK

T. Rossetto
UCL, UK

KEYNOTE LECTURE
The interplay of multiple hazards and urban development: the context of Istanbul

16:00

16:00

16:45

10 min. BREAK

SPECIAL SESSION
Insurance & engineering towards a more effective risk management

Organisers
A. Mouyiannou
M. Deyanova

16:55

17:55

10 min. BREAK

J. L .Briaud
ASCE, USA

KEYNOTE LECTURE
The 2021 Report Card for America's Infrastructure

18:05

18:05

18:50

10 min. BREAK

ROUND TABLE
ICONHIC Round Table "Eyes on the Future"

G. Gazetas, NTUA, GREECE
I. Anastasopoulos, ETH Zurich, SWITZERLAND
R. Kourkoulis, ICONHIC, GREECE

19:00

SPECIAL SESSION
Multi-hazard risk & resilience assessment: Novel applications to networks and systems of assets

Organisers
D. Vamvatsikos
A. Kazantzi
K. Bakalis
V. Melissianos

19:25

CLOSING REMARKS
G. Gazetas, NTUA, GREECE
I. Anastasopoulos, ETH Zurich, SWITZERLAND
A. Alvertos, ICONHIC, GREECE

20:40

21:00

TUESDAY 22 JUNE 14:00 – 21:00 (EEST | UTC +3 | EDT +7)

TUE 22

WELCOME TALK

14:00 - 14:15 **G. Gazetas**
I. Anastasopoulos
R. Kourkoulis

SPECIAL SESSION — PART 1

Innovative Ground Interventions & Metamaterial Concepts for Structure Protection

Organizers: **E. Chatzi, A. Marzani, I. Antoniadis**

	INTRO
14:15 - 14:25	A phononic metamaterial incorporating directional amplification for low-frequency isolation **M. Kalderon,** A. Paradeisiotis, I. Antoniadis (ID. 213)
14:25 - 14:35	Vibration mitigation via octet lattice structures **G. Aguzzi**, A. Colombi, E. N. Chatzi (ID. 228)
14:35 - 14:45	Vibration reduction effects of pile group foundations during the passage of nearby moving surface loads **G. Efthymiou**, C. Vrettos (ID. 241)
14:45 - 14:55	Double-frequency control of sound by using coupled Helmholtz resonators **R. Sabat**, G. Leveque, Y. Pennec, D. Torrent, B. Djafari-Rouhani (ID. 242)
14:55-15:05	Novel structural configuration of mechanical metamaterials for seismic isolation **N. Hima**, F. D. Corso, D. Bigoni (ID. 243)
15:05 - 15:10	MINI BREAK
15:10 - 15:20	Seismic protection of an existing structure using resonating unit-cell metamaterials: An elastic parametric analysis **C. Kanellopoulos**, B. Stojadinovic (ID. 249)
15:20 - 15:30	A novel force-limiting system based on bifurcation effects for the isolation of structures **P. Koutsogiannakis**, F. D. Corso, D. Bigoni (ID. 250)
15:30 - 15:40	A metamaterial design for structural vibration mitigation exploiting geometrically nonlinear behaviour **K. A. Chondrogiannis**, V. Dertimanis, E. Chatzi (ID. 253)
15:40 - 15:50	A metamaterial layout for blast protection of steel pipes against surface explosion **M. Kontogeorgos**, N. Gerolymos, I. Antoniadis (ID. 277)
	CLOSURE

15:50 – 16:00 **BREAK**

KEYNOTE LECTURE

16:00 - 16:45 **T. Rossetto** | UCL, UK
The interplay of multiple hazards and urban development: the context of Istanbul

16:45 – 16:55 **BREAK**

SPECIAL SESSION

Insurance and engineering towards a more effective risk Management

Organizers: **A. Mouyiannou, M. Deyanova**

16:55 - 17:10	INTRO TALK
17:10 - 17:17	Catastrophe models: Value proposition and some misconceptions **L. Sousa** (ID. 193)
17:17 - 17:24	Evolving Risks – how science-driven approaches can be used to create market-driven solutions for insurers and lenders **J. Butler** (ID. 361)
17:24 - 17:31	Taking the risk out of risk profiles: A critical review for Latin America & the Caribbean **A. Pomonis**, J. Macabuag, J. Daniell, R. Gunasekera (ID. 303)

17:31 - 17:38	Design and implementation of a parametric insurance cover to mitigate natural disaster risk of infrastructure systems **R. Guidotti**, G. Franco, R. Kourkoulis, F. Gelagoti, A. Tsatsis (ID. 172)
17:38 - 17:55	ROUND TABLE DISCUSSION

17:55 - 18:05	**BREAK**

KEYNOTE LECTURE

18:05 - 18:50	**J. L. Briaud** | ASCE, 2021 President, USA The 2021 Report Card for America's Infrastructure

18:50 - 19:00	**BREAK**

ROUND TABLE

ICONHIC Round Table "Eyes on the Future"

19:00 - 19:25	**G. Gazetas** | NTUA, GREECE **I. Anastasopoulos** | ETH Zurich, SWITZERLAND **R. Kourkoulis** | ICONHIC, GREECE

SPECIAL SESSION

Multi-hazard risk & resilience assessment: Novel applications to networks and systems of assets

Organizers: **D. Vamvatsikos, A. Kazantzi, K. Bakalis, V. Melissianos**

19:25 - 19:35	INTRO TALK
19:35 - 19:40	Updating structural FE models of cultural heritage assets based on probabilistic tools M. L. Jalon-Ramirez, M. Chiachío, **J. Chiachío**, L. M. Gil-Martin, E. Hernández-Montes (ID. 227)
19:40 - 19:45	Probabilistic agent-based community framework for quantifying education system resilience **M. Koliou**, M. Aghababaei (ID. 244)
19:45 - 19:50	Illustrating a probabilistic model for the post-earthquake lifeline recovery time estimation and its effects on functional recovery of buildings **M. Koliou**, N. Mohammadgholibeyki (ID. 343)
19:50 - 19:55	The HAPI sensor-aware framework for infrastructure risk and resilience assessment **D. Vamvatsikos**, A.Chatzidaki (ID. 384)
19:55 - 20:05	Panel Discussion **A. Taflanidis, T. Lin, D. Vamvatsikos**
20:05 - 20:10	MINI BREAK
20:10 - 20:40	Q&A

CLOSING REMARKS

20:40 – 21:00	**G. Gazetas** **I. Anastasopoulos** **A. Alvertos**

Wednesday's Schedule at a glance

13:30 - 21:05

EEST | UTC +3 | EDT +7

23 June

13:30

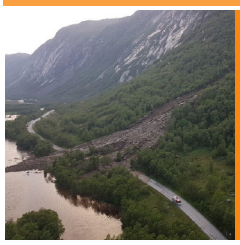
IGNITE TALK

13:35

THEME LECTURE

S. Cuomo, University of Salerno, Italy

Hydro-mechanical modelling of fast landslides impacting structures



SPECIAL SESSION

Physical and Numerical Modelling of Landslide -Structure-Interaction (LSI)

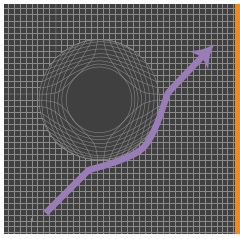
Organisers

S. Cuomo
M. Martinelli
V. Thakur
C. Choi

14:00

15:10

10 min. **BREAK**



SPECIAL SESSION

Innovative Ground Interventions & Metamaterial Concepts for Structure Protection

PART 2

Organisers

E. Chatzi
A. Marzani
I. Antoniadis

15:20

16:55

10 min. **BREAK**

SPECIAL SESSION

Structural Design for Extra-Terrestrial Natural Hazards

Organisers

G. Kampas
C. Malaga-Chuquitaype
A. Kapoglou
M. Memarzade

17:05

18:05

10 min. **BREAK**

D. Green
NASA, USA

KEYNOTE LECTURE

NASA Making Space for Risk Reduction

18:15

18:15

19:00

10 min. **BREAK**

SPECIAL SESSION

Improving Resilience of Critical Energy Infrastructures

Organisers

C. Fuggini
G. Giunta
S. Karamanos

19:10

20:45

WORKSHOP CLOSURE

G. Gazetas, NTUA, GREECE
I. Anastasopoulos, ETH Zurich, SWITZERLAND

21:05

WEDNESDAY 23 JUNE 13:30 – 21:05 (EEST | UTC +3 | EDT +7)

13:30 - 13:35	**IGNITE TALK**
13:35 - 14:00	**Theme Lecture.** Hydro-mechanical modelling of fast landslides impacting structures **S. Cuomo** | University of Salerno, Italy

SPECIAL SESSION
Physical and Numerical Modelling of Landslide-Structure-Interaction
Organizers: **S. Cuomo, M. Martinelli, V. Thakur, C. Choi**

14:00 - 14:10	INTRO PANEL DISCUSSION
14:10 - 14:17	Internal shearing in compound landslides and consequences on structure interaction **A. Yerro**, N. Nissar (ID. 254)
14:17 - 14:24	MPM modelling and sensitivity analysis of Valarties flow-like landslide **G. Di Carluccio**, N. Pinyol (ID. 350)
14:24- 14:31	Interaction between flow-type landslides and forests **Z. Liang**, C. E. Choi (ID. 363)
14:31 - 14:38	MPM modelling of flow-like landslides impacting protection structures **A. Di Perna**, S. Cuomo, N. Martinelli (ID. 370)
14:38 - 14:45	Large-scale debris impact test on flexible barrier and back-analysis using LS-DYNA E. Sze, H.W.K. Lam, C. W. W. Ng, S. Poudral, **C. E. Choi** (ID. 365)
14:45 - 15:10	ROUND TABLE DISCUSSION

15:10 – 15:20	**BREAK**

SPECIAL SESSION **PART 2**
Innovative Ground Interventions & Metamaterial Concepts for Structure Protection
Organizers: **E. Chatzi, A. Marzani, I. Antoniadis**

	INTRO
15:20 - 15:30	Inertial amplified panel for low-frequency vibration attenuation **R. Zaccherini**, A. Colombi, A. Palermo, V. K. Dertimanis, E. N. Chatzi (ID. 284)
15:30 - 15:40	Railway vibration mitigation measures: a case study based on the T2000 tram circulating in Brussels **S. Ouakka**, O. Verlinden, G. Kouroussis (ID. 287)
15:40 - 15:50	A Green's function-based formulation to model Rayleigh waves interacting with finite-size metasurfaces **X. Pu**, A. Palermo, A. Marzani (ID. 301)
15:50 - 16:00	Locally resonant metamaterials for the manipulation of vertically polarized surface waves **F. Zeighami**, A. Palermo, A. Marzani (ID. 273)
16:00 - 16:10	Cloaking of love waves **Z. Chatzopoulos**, A. Palermo, S. Guenneau, A. Marzani (ID. 300)
16:10 - 16:15	MINI BREAK
16:15 - 16:25	Exploiting metamaterials for base isolated structures **S. Fiore**, E. Chatzi, M. Chiappini, G. Finocchio (ID. 321)
16:25 - 16:35	Passive dynamic absorber based on the extended KDamper Concept for seismic retrofitting of RC buildings **A. Mantakas**, A. Alvertos, K. Kapasakalis, I. Antoniadis, E. Sapountzakis (ID. 352)
16:35 - 16:45	Implementation of the KDamper concept to the seismic protection of bridge structures: Nonlinearities and soil-structure interaction effects **M. Antoniou**, A. Alvertos, I. Antoniadis, E. Sapountzakis (ID. 353)
16:45 - 16:55	ROUND TABLE DISCUSSION

16:55 - 17:05	**BREAK**

SPECIAL SESSION
Structural Design for Extra-Terrestrial Natural
Organizers: **G. Kampas, C. Malaga-Chuquitaype, A.Kapoglou, M. Memarzadeh**

17:05 - 17:20	INTRO TALK
17:20 - 17:28	Extraterrestrial architecture on Mars **M. Northstar** (ID. 346)
17:28 - 17:36	A preliminary assessment of lunar recordings from a ground-motion point of view **O. J. Ktenidou**, G. Zalachoris (ID. 379)
17:36 - 17:44	Cellular fabrication (C-Fab®) for extra-terrestrial structures **D. Goodloe**, J.McCabe (ID. 383)
17:44 - 18:52	Structural design of a lunar habitat module **L. T. Kibriya**
17:52 - 18:05	Q&A AND ROUND TABLE DISCUSSION

18:05 - 18:15	**BREAK**

KEYNOTE LECTURE

18:15 - 19:00	**D. Green** | NASA, USA NASA Making Space for Risk Reduction

19:00 – 19:10	**BREAK**

SPECIAL SESSION
Improving Resilience of Critical Energy Infrastructures
Organizers: **C. Fuggini, G. Giunta, S. Karamanos**

19:10 - 19:20	INTRO TALK
19:20 - 19:35	An integrated model for the seismic risk assessment of an oil refinery **V. Melissianos**, N. D. Karaferis, D. Vamvatsikos, K. Bakalis, A. K. Kazantzi (ID. 202)
19:35 - 19:50	Asset integrity monitoring for gas pipelines resilience improvement **S. Cesari**, G. Giunta, S. Di Giudice (ID. 257)
19:50 - 20:05	Third party interference and leakage detection in gas pipelines by means of distributed acoustic sensing technology: a field application study **P. Corvaglia**, G. Iobbi, G. Giunta, C. Huynh, G. Calbris (ID. 318)
20:05 - 20:13	A risk assessment methodology of buried steel pipeline subjected to permanent ground displacements due to seismically-induced slope failure **A. Tsatsis**, R. Kourkoulis (ID. 351)
20:13 - 20:28	Rainfall-induced landslide forecast tool: an application to gas pipelines **F. Ioele**, C. Evangelista, G. Malgesini, E. Ponzoni, O. Zanoli, E. Di Martino, G. Bottino, G. Guinta (ID. 364)
20:28 - 20:45	CONCLUDING TALK

WORKSHOP CLOSURE

20:45 - 21:05	**G. Gazetas** **I. Anastasopoulos**

KEYNOTE LECTURES

JEAN-LOUIS BRIAUD
ASCE 2021 President

22 June 2021 | 18:05
EEST | UTC +3 | EDT +7

The 2021 Report Card for America's Infrastructure

Every four years, the American Society of Civil Engineers provides a comprehensive assessment of the nation's 17 major infrastructure categories in ASCE's Infrastructure Report Card. Using a simple A to F school report card format, the Report Card examines current infrastructure conditions and needs, assigning grades and making recommendations to raise them. Join this plenary session to hear from ASCE President Jean-Louis Briaud, Ph.D., PE, D.GE, DIST.M.ASCE, about key findings in this year's report and the solutions to raise the grades.

DR D. GREEN
Program Manager NASA,
Applied Sciences Program, USA

23 June 2021 | 18:15
EEST | UTC +3 | EDT +7

NASA Making Space for Risk Reduction

Earth observations through remote sensing from space reveals much about our changing planet including the nature of natural hazards and the vulnerability and exposure of our infrastructure. Monitoring over time and at scales from global to local provide the data for situational awareness to access risk and develop resilience. This presentation will provide a NASA Disasters Program perspective on access to earth observation enable and the use and utility of data to modeling earth systems enables science-informed choices, supports decisions and guides early action. Perils happen, disasters are not natural, and making space for risk reduction means open science and accessible data will help answer what happens next. Making space for risk reduction can increase the tools available to avoid infrastructure damage and losses, minimize disruptions to lives and lifelines, protect our livelihoods and economies.

22 June 2021 | 16:00
EEST | UTC +3 | EDT +7

The interplay of multiple hazards and urban development: the context of Istanbul

PROF. TIZIANA ROSSETTO
University College London, UK

Tomorrow's Cities is the UK Research and Innovation (UKRI) Global Challenges Research Fund (GCRF). Urban Disaster Risk Hub is an interdisciplinary research hub with the aim to catalyse a transition from crisis management to multi-hazard risk-informed and inclusive planning in four cities in low-and-middle income countries. Istanbul in Turkey is one of the four cities investigated. As a result of unplanned urban expansion and illegal construction processes in the 80s and 90s in the city, two major earthquakes in 1999 resulted in 18.000 deaths and $16 billion economic loss, changing the authorities' perspective to hazard risk and mitigation forever. Despite the past 20-year-long research endeavours, Istanbul's earthquake risk remains high, while recent urban developments to the west are exposed to new hazards, namely flash flooding, and landslides. Given the particularly high risk of such hazards on areas characterized by poor infrastructural resilience and social vulnerabilities, it is crucial to integrate different types of hazards and risks into the urban development context for future scenarios, so that a physically and socio-economically safer development that prioritizes the wellbeing of local communities can be facilitated. This presentation summarises the research conducted in Istanbul over the first 18 months of the Tomorrow's Cities Project by a consortium of Turkish and UK researchers, spanning the better characterisation of earthquake and landslide hazards, development of analysis methods for predicting the response of case study buildings to multiple hazards and a Bayesian network-based approach for assessing road infrastructure resilience under multiple hazard scenarios.