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Hyperion

Welcome to HYPERION's 5th Newsletter!


In this issue, you will have the opportunity to follow the project's internal and external events, the research activities performed by the scientific team, and to access HYPERION's publications and presentations, delving into the research areas you are interested in.

Enjoy science through HYPERION project!

Yours,

The HYPERION team

HYPERION'S NEWS & EVENTS

 **Online conference with I.I.S. Statale "Ettore Majorana - Elena Corner"| 8 January 2021 | Mirano (VE), Italy**

In the frame of the **"UniPadova Incontra"** (UniPadova Meets) - an initiative organised by the University of Padova which included a variety of seminars on different topics - an online seminar was organized for the high schools of the region "I.I.S. Statale Ettore Majorana - Elena Corner".

"I.I.S. Statale "Ettore Majorana - Elena Corner" is a Grammar School or Classical Secondary School, focusing on humanities and residing in Mirano (VE), Italy.

The seminar's title was: **"Anche le rocce invecchiano: il degrado dei monumenti"** (Also stones get old: the decay of the monuments) and it was presented by Professor Claudio Mazzoli.

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HYPERION's leaflet was translated in French and German by the University of Padova | 19 January 2021

University of Padova supported HYPERION's dissemination activities and "enlarged" the HYPERION target audience, by translating the official project leaflet in two more languages, German and French.


[Check Out The Leaflet](#)

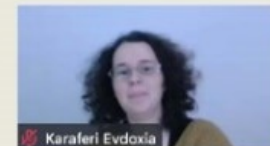
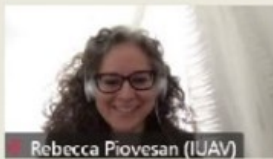
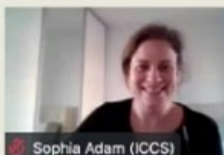
1st Project Review Meeting | 4 March 2021 | Online

On the 4th of March 2021, HYPERION organized its first constructive periodic review meeting. The project's coordinator thanked everyone for their contribution and especially the EASME Project Adviser and the two experts who followed the project with dedication. All WP leaders presented the research work implemented during the project and the challenges they faced due to COVID-19.



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1st Period Review Meeting
March 04, 2021




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 **Research Visits at St. Mark's Square | 25 February 2021**
|Venice, Italy



On February 25th and April 9th, 2021, partners from the University of Padova (UNIPD) and University of Venice (IUAV) carried out a survey for the Tier 1 building in Venice the “Torre dell’ Orologio” (Clock Tower) on St. Mark’s Square. Researchers used two drones, flying over Piazza San Marco, carrying a drone-based photogrammetric device, a hyperspectral camera in the VNIR (Visible-Near InfraRed) range, and a thermal camera. The support provided by the Municipality of Venice and the Municipal Police is gratefully acknowledged. These visits aimed to support the consortium in gathering more data for Venice’s pilot site to proceed with the following research steps.

[Watch The Video](#)

 **Practical examples on heritage stones research, | 17-20 May 2021 |Department of Geosciences, University of Padova Italy**



On the 17-20 of May 2021, the University of Padova organized 8 seminars on Practical examples for the PH.D. Course in Geosciences targeted specifically on the HYPERION's outcomes. David Martín Freire-Lista from the Geosciences Center (CGeo) – University of Coimbra (UC), Geology Department - University of Trás-os-Montes e Alto Douro (UTAD), delivered a short course on “Practical examples on heritage stones research” based on HYPERION's recent studies.

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Geoscience Union Meeting 2021 |5 June 2021| Online

Luigi Germinario from the University of Padova successfully organized the session on “Weathering and Conservation of Cultural Heritage and Geosites” at the Geoscience Union Meeting 2021, which was held online on June 5th, 2021. The session's scope was on Cultural Heritage (World Heritage Sites, historical structures, archaeological artifacts, etc.) and on Geoheritage (geosites, geoparks, etc.) that are exposed to weathering in the geological and human time scale. The session was proved as a great opportunity to present HYPERION project and part of its results and disseminate them outside Europe to a wider audience, attracting more attention to this ambitious project.

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La chiesa di Santa Maria dei Servi |17 September 2021 | Venice, Italy

On the 17th of September 2021, Chiara Coletti presented HYPERION project in the webinar that took place at La chiesa di Santa Maria dei Servi (Tier 2

building). The presentation's title was “Updates and new research”.

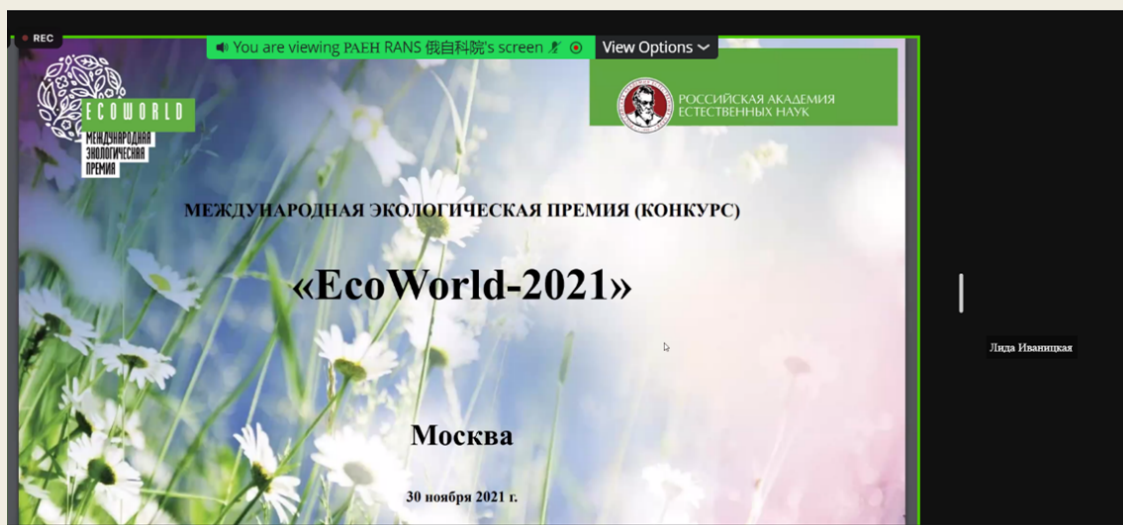
[Read More](#)

Seminar by RED Srl | 27 October 2021 | National Technical University of Athens, Greece

Ettore Fagà, COO - Earthquake Risk Senior Manager, and Andrea Amati, Structural Engineer - Catastrophe Risk Modeling, at RED Srl, presented a seminar entitled “Catastrophe risk modeling in real life: Pacific Islands and the Caribbean”. The seminar was organized on the 27th of October 2021 at the Auditorium of the Institute of Steel structures at the National Technical University of Athens in Greece.

[Watch The Seminar Online](#)

HYPERION, awarded by the Russian Academy of Natural Sciences (RAEN)|30 November 2021| Online



On the 30th of November 2021, HYPERION was awarded with the “Laurate 1st Series” during the International Environmental Competition “EcoWorld-2021”, held by the Russian Academy of Natural Sciences. HYPERION received the award for its significant research contribution on the international ecological and architectural impact and it was selected among numerous international projects.

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CONFERENCES & SCIENTIFIC MEETINGS

17th World Conference on Earthquake Engineering, 17WCEE | December 2021, Sendai International Center, Sendai, Japan | Hybrid

During the conference the following topics were presented by HYPERION partners:

1. A comparative study on the initial in-plane stiffness of Masonry walls with opening

By A. Shaban, M. Kioumars (Department of Civil Engineering and Energy Technology, Oslo Metropolitan University, Oslo, Norway), V. Plevris, (Department of Civil and Architectural Engineering, Qatar University, Doha, Qatar).

[Read The Paper](#)

2. Seismic risk assessment of the ancient temple of Aphaia in Greece

By V.E. Melissianos, M.-E. Dasiou, D. Vamvatsikos, (School of Civil Engineering, National Technical University of Athens, Greece).

[Read The Paper](#)

3. Attribute-driven fragility curve through class disaggregation

By A.K. Kazantzi, D. Vamvatsikos (School of Civil Engineering, National Technical University of Athens, Greece).

[Read The Paper](#)

The Conservation of Cultural Heritage Between Climate Change and Atmospheric Pollution | 8-9 November 2021 | Venice, Italy

“HYPERION (EU HO 2020). Cambiamenti climatici, eventi estremi e resilienza di aree storico monumentali: il caso studio della Torre dell’Orologio di Venezia”

By R. Piovesan, E. Tesser, F. Antonelli (LAMA, Laboratory of Analysis of Ancient Materials, IUAV University of Venice).

[Read More](#)

ICSEA 2021: 16th International Conference on Software Engineering Advances| 3-7October 2021 | Barcelona, Spain

A Communities Engagement Tool for Assessing the Resilience and Deterioration of Cultural Heritage Sites

By N. Tousert, A. Kalis, M. Krommyda, N. Frangakis, S. N. Bolierakis, A. Amditis (Institute of Communication and Computer Systems, Athens, Greece).

[Read The Paper](#)

31st European Safety and Reliability Conference | 19-23 September 2021 | Angers, France

Updating structural FE models of cultural heritage assets based on probabilistic tools

By M. L. Jalón, J. Chiachío, L. M. Gil-Martín, M. Chiachío, E. Hernández-Montes (Departamento de Mecánica de Estructuras e Ingeniería Hidráulica, University of Granada, Spain) and R. Rodríguez-Romero and V. Compán-Cardiel (Departamento de Edificación e Ingeniería del Terreno, University of Seville, Spain).

[Read The Paper](#)

Japan Geoscience Union Meeting |5 June 2021| Online

Session M-IS09: Weathering and conservation of cultural heritage and

geosites, Convener: Luigi Germinario

HYPERION: understanding and quantifying the effects of climate change on cultural heritage

By C. Coletti, L. Germinario, A. Galgaro, L. Maritan, M. Massironi, J. Nava, R. Sassi, C. Mazzoli (Department of Geosciences, University of Padova, Padova, Italy) R. Piovesan, E. Tesser, F. Antonelli, (Laboratory for Analysing Materials of Ancient origin (LAMA), University IUAV of Venice, Venice, Italy) and R. Bertoncello (Department of Chemical Sciences, University of Padova, Padova, Italy).

[Learn More](#)

9th Turkish Conference on Earthquake Engineering, 2021| 2-4 June 2021 | Istanbul, Turkey

A Dürüm Döner view of seismic risk assessment

By D. Vamvatsikos, School of Civil Engineering, National Technical University of Athens, Greece.

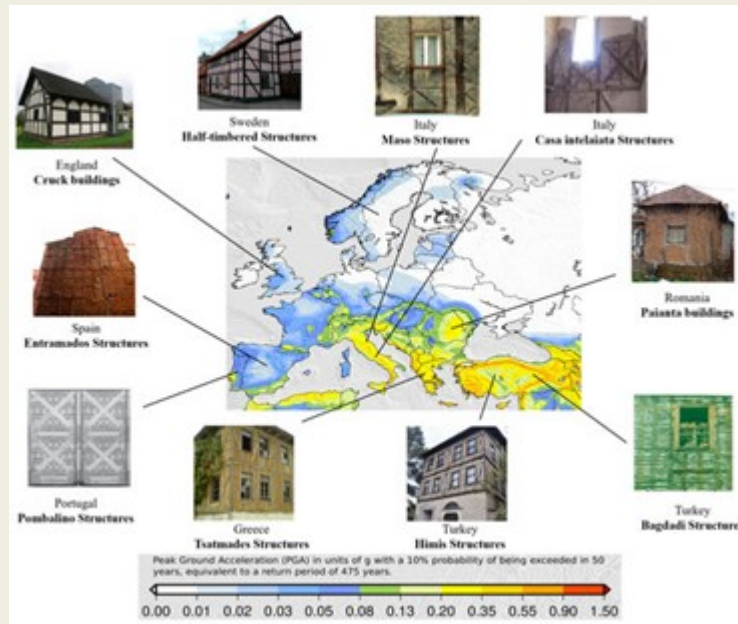
[Read The Paper](#)

PUBLICATIONS

The Seismic Vulnerability Assessment and Strengthening of Heritage Timber Buildings: A Review

Amirhosein Shabani, Mahdi Kioumars (Department of Civil Engineering and Energy Technology, Oslo Metropolitan University), Ali Alinejad (Department of Civil and Resource Engineering, Dalhousie University, Canada) Mohammad Teymouri (Department of Civil and Environmental Engineering, Colorado State University, USA), André Nascimento Costa (Department of Civil Engineering, University of the Valley of Itajaí, Brazil) and Mahgol Shabani (Department of Civil Engineering, Shomal University, Mazandaran, Iran) published at the Special Issue of The Methods, Tools and Techniques for the Preservation of Existing Structures of the MDPI journal **“Buildings”**, Volume 11, Issue 12, pp.661-685 on December 18,

2021 a paper entitled the article “The Seismic Vulnerability Assessment and Strengthening of Heritage Timber Buildings: A Review”.



Hazard map of the European countries based on PGA and various types of timber frame buildings in different European countries.

[Read The Full Article](#)

Structural Model Updating a Historical Stone Masonry Tower in Tønsberg, Norway

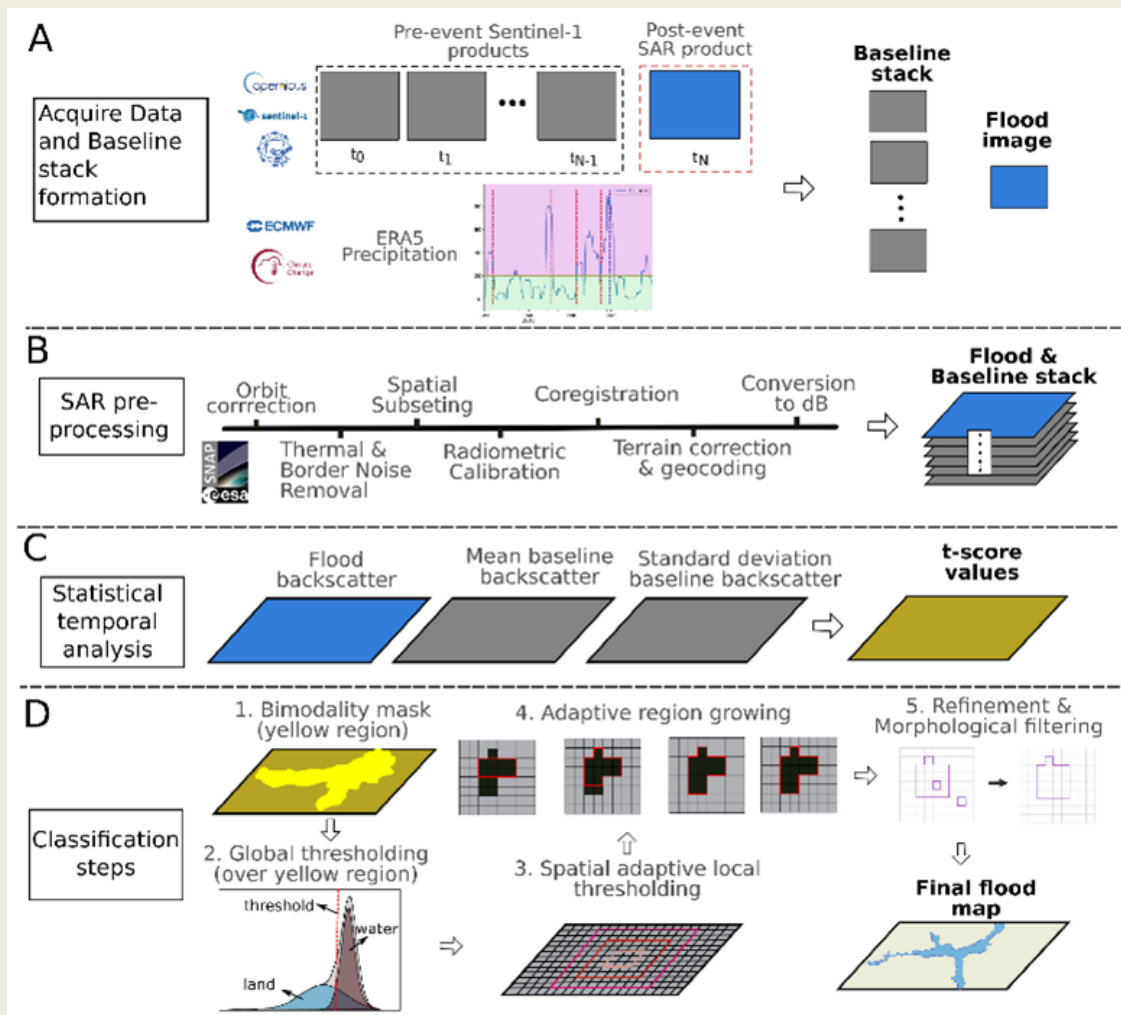
Amirhosein Shabani, Agon Ademi and Mahdi Kioumars (Department of Civil Engineering and Energy Technology, Oslo Metropolitan University), published a paper in Springer's Book “**Protection of Historical Constructions**” which is part of the lecture notes in Civil Engineering book series (LNCE, volume 209, pp.576-585, on December 04, 2021. The paper was entitled “Structural Model Updating a Historical Stone Masonry Tower in Tønsberg, Norway” and was first presented in PROHITECH 2021.

[Read The Full Paper](#)

FLOMPY: An Open-Source Toolbox for Floodwater Mapping Using Sentinel-1 Intensity Time Series

Kleanthis Karamvasis and Vassilia Karathanassi (Laboratory of Remote

Sensing, National Technical University of Athens, Greece) published in the Open Access Journal of MDPI **“Water”**, Volume 13, Issue 21, pp. 2943-2957, on October 20, 2021 the paper belonging to the Section Hydrology, entitled **“FLOMPY: An Open-Source Toolbox for Floodwater Mapping Using Sentinel-1 Intensity Time Series”**.



Flowchart of the four-step proposed methodological pipeline (FLOMPY).

[Read The Full Paper](#)

Seismic response distribution expressions for on-ground rigid rocking blocks under ordinary ground motions

Athanasia K. Kazantzi, Christos G. Lachanas and Dimitrios Vamvatsikos (School of Civil Engineering, National Technical University of Athens, Athens, Greece) published in Wiley's Journal **“Earthquake Engineering & Structural Dynamics”**, Volume 50, Issue 12, pp.3311–3331, on July 06, 2021 the article **“Seismic response distribution expressions for on-ground rigid rocking blocks**

under ordinary ground motions”.

[Read The Full Paper](#)

Conditional spectrum record selection faithful to causative earthquake parameter distributions

Mohsen Kohrangi (RED, Risk Engineering + Development, Pavia, Italy), Andrea Spillatura, Paolo Bazzurro (Istituto Universitario Di Studi Superiori Di Pavia, Pavia, Italy) and Dimitrios Vamvatsikos (School of Civil Engineering, National Technical University of Athens, Greece) published in Wiley’s Journal **“Earthquake Engineering & Structural Dynamics”**, Volume 50, Issue 10, pp.2653–267, on April 29, 2021 the article “Conditional spectrum record selection faithful to causative earthquake parameter distributions”.

[Read The Full Paper](#)

Probabilistic identification of surface recession patterns in heritage buildings based on digital photogrammetry

María L. Jalón, Luisa María Gil-Martín, Enrique Hernández-Montes (Department of Structural Mechanics and Hydraulic Engineering, University of Granada, Spain) and Juan Chiachío (Department of Structural Mechanics and Hydraulic Engineering, University of Granada, Spain and Andalusian Research Institute in Data Science and Computational Intelligence (DaSCI), Granada, Spain) published in Elsevier’s Journal **“Journal of Building Engineering”**, Volume 34, Issue 10, pp., in February 2021 the article “Probabilistic identification of surface recession patterns in heritage buildings based on digital photogrammetry”.

[Read The Full Paper](#)

Seismic risk and loss estimation for the building stock in Isfahan. Part I: Exposure and vulnerability

Mohsen Kohrangi, (RED, Risk Engineering + Development, Pavia, Italy) Paolo Bazzurro (Istituto Universitario Di Studi Superiori Di Pavia, Pavia, Italy) and Dimitrios Vamvatsikos (School of Civil Engineering, National Technical University of Athens, Greece) published in Springer's Journal "**Bulletin of Earthquake Engineering**", Volume 19, pp. 1709–1737, on January 28, 2021 the article "Seismic risk and loss estimation for the building stock in Isfahan. Part I: Exposure and vulnerability".

[Read The Full Paper](#)

Practical performance-based design of friction pendulum bearings for a seismically isolated steel top story spanning two RC towers

Athanasia K. Kazantzi, and Dimitrios Vamvatsikos (School of Civil Engineering, National Technical University of Athens, Athens, Greece) published in Springer's Journal "**Bulletin of Earthquake Engineering**", Volume 19, pp. 1231–1748, on December 2, 2020 the article "Practical performance-based design of friction pendulum bearings for a seismically isolated steel top story spanning two RC towers".

[Read The Full Paper](#)

Structural Vulnerability Assessment of Heritage Timber Buildings: A Methodological Proposal

Amirhosein Shabani, Mahdi Kioumars, Vagelis Plevris (Department of Civil Engineering and Energy Technology, Oslo Metropolitan University), and Haris Stamatopoulos (Department of Structural Engineering, Norwegian University of Science and Technology (NTNU), Trondheim, Norway) published in the MDPI journal "**Forests**" volume 11, issue 8, pp.881 on August 13, 2020, a paper entitled "Structural Vulnerability Assessment of Heritage Timber Buildings: A Methodological Proposal"

THE PARTNERS



[View all Partners](#)

HYPERION is a 42-month EC Funded project which started on 1st June 2019. This work is part of the Hyperion project.

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