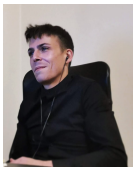
CURRICULUM VITAE

Birth date:	March 6, 1992
Email:	filippo.masi@sydney.edu.au
Website:	filippo-masi.github.io
Profiles:	Scholar - OrcidID - Scopus - RG
Channels:	LinkedIn - X (Twitter) - YouTube



1 EMPLOYMENT

01/12/2022 – present **Postdoctoral researcher** under ARC Discovery Project – Grant agreement ID DP220101164, School of Civil Engineering, The University of Sydney, Australia.

01/01/2021 – 30/11/2022 **Postdoctoral researcher** under ERC-StG CoQuake – Grant agreement ID 757848, GeM (UMR 6183), École Centrale de Nantes, France.

02/11/2020 – 31/12/2020 **Research Engineer**, École Centrale de Nantes (Centrale Innovation), France.

18/09/2017 – 31/10/2020 **Engineer – CIFRE**, Ingérop Conseil et Ingénierie, Rueil-Malmaison, France.

2 ACADEMIC DEGREES

10/2017 – 12/2020 **PhD**, Mechanics – École Centrale de Nantes (École des Ponts ParisTech, University of Versailles and St-Quentin, and Ingérop), Nantes, France.
Supervisors: I Stefanou, P Vannucci.

01/2016 – 07/2017 **Master**, Mechanical Engineering, University of Florence, Italy (solemn commendation).
Supervisors: P M Mariano, B Facchini.

10/2013 – 12/2015 **Bachelor**, Mechanical Engineering, University of Florence, Italy.
Supervisor: P M Mariano.

3 HONOURS AND AWARDS

2022 Early Career Researcher Award by EUROMECH (European Mechanics Society) on the occasion of the 18th European Mechanics of Materials Conference, Oxford, UK.

2021 Award for the best PhD thesis bringing technological and conceptual breakthroughs in the industry by Centrale Innovation (Écoles Centrales Group).

2021 Award for the best PhD by CSMA (Computational Structural Mechanics Association).

4 SCIENTIFIC PRODUCTION

Author of **12 articles** in major multi-disciplinary scientific journals and leading peer-reviewed international journals, **two chapters**, **25 communications/posters** in international and national conferences, and **nine invited seminars/workshop**. All contributions, except for [F4], are freely available via open-science platforms (HAL and arXiv), indicated by their URL address, whenever not freely available at the provided DOI. The access to [F4] is restricted as classified "*confidentiel défense*."

4.1 Refereed journal articles

[1] **F Masi** and I Einav. "Neural integration for constitutive equations using small data". In: *Comput Methods Appl Mech Eng* 420 (2024), p. 116698. DOI: 10.1016/j.cma.2023.116698.

[2] **F Masi** and I Stefanou. "Evolution TANN and the identification of internal variables and evolution equations in solid mechanics". In: *J Mech Phys Solids* 174 (2023). DOI: 10.1016/j.jmps.2023.105245. URL: https://arxiv.org/abs/2209.13269.

[3] **F Masi** and I Stefanou. "Multiscale modeling of inelastic materials with Thermodynamics-based Artificial Neural Networks (TANN)". In: *Comput Methods Appl Mech Eng* 398 (2022), p. 115190. DOI: 10.1016/j.cma.2022.115190. URL: https://arxiv.org/abs/2108.13137.

[4] **F Masi**, I Stefanou, and V Maffi-Berthier. "Scaling laws for rigid-body response of masonry structures under blast loads". In: *J Eng Mech (featured in the Editor's Choice section)* 147.10 (2021), p. 04021078. DOI: 10.1061/(ASCE)EM.1943-7889.0001986. URL: https://arxiv.org/abs/2012.09494.

[5] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Thermodynamics-based Artificial Neural Networks for constitutive modeling". In: *J Mech Phys Solids* 147 (2021), p. 104277. DOI: 10.1016/j.jmps.2020.104277. URL: https://arxiv.org/abs/2005.12183.

[6] **F Masi**, I Stefanou, V Maffi-Berthier, and P Vannucci. "A Discrete Element Method based-approach for arched masonry structures under blast loads". In: *Eng Struct* 216 (2020), p. 110721. DOI: 10.1016/j.engstruct.2020.110721. URL: https://hal.science/hal-02320696v2.

[7] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Resistance of museum artefacts against blast loading". In: *J Cul Her* 44 (2020), pp. 163–173. DOI: 10.1016/j.culher.2020.01.015. URL: https://hal.science/hal-02320029.

[8] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Rocking response of inverted pendulum structures under blast loading". In: *Int J Mech Sci* 157-158 (2019), pp. 833–848. DOI: 10.1016/j.ijmecsci.2019.05.024. URL: https://hal.science/hal-02132167.

[9] P Vannucci, **F Masi**, and I Stefanou. "A nonlinear approach to the wind strength of Gothic Cathedrals: The case of Notre Dame of Paris". In: *Eng Struct* 183 (2019), pp. 860–873. ISSN: 0141-0296. DOI: https://doi.org/10.1016/j.engstruct.2019.01.030. URL: https://hal.science/hal-01458767v5.

[10] **F Masi**, PM Mariano, and P Vannucci. "Blast actions in aircrafts: An integrated methodology for designing protection devices". In: *Eng Struct* 175 (2018), pp. 895–911. DOI: 10.1016/j.engstruct.2018.08.082. URL: https://hal.science/hal-01720002v2.

[11] **F Masi**, I Stefanou, and P Vannucci. "A study on the effects of an explosion in the Pantheon of Rome". In: *Eng Struct* 164 (2018), pp. 259–273. DOI: 10.1016/j.engstruct.2018.02.082. URL: https://hal.science/hal-01493006v2.

[12] **F Masi**, I Stefanou, and P Vannucci. "On the origin of the cracks in the dome of the Pantheon in Rome". In: *Eng Fail Anal* 92 (2018), pp. 587–596. DOI: 10.1016/j.engfailanal.2018.06.013. URL: https://hal.science/hal-01719997v3.

4.2 Book chapters

[A1] **F Masi**. "Chapter 2. Introduction to regression methods". In: *Machine Learning in Geomechanics, vol. I (in press – postprint)*. Ed. by I Stefanou and F Darve. Wiley, ISTE, 2024.

[A2] **F Masi** and I Stefanou. "Chapter 3. Physics-informed and thermodynamics-based artificial neural networks for constitutive modeling". In: *Machine Learning in Geomechanics, vol. II (in press – postprint)*. Ed. by I Stefanou and F Darve. Wiley, ISTE, 2024.

4.3 Reviewed international conferences

[B1] A Morsel, **F Masi**, I Stefanou, P Kotronis, G Racineux, and E Marché. "Reduced-scale testing of masonry structures to explosions". In: *9th International Conference on Structural Engineering and Concrete Technology: ICSECT 2024, London, United Kingdom, April 14 – 16 (Accepted – in press)*. 2024.

[B2] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Material modeling via thermodynamics-based artificial neural networks". In: *Geometric Structures of Statistical Physics, Information Geometry, and Learning*. Ed. by F Barbaresco and F Nielsen. Les Houches, France: Springer International Publishing, 27–31 July 2021, pp. 308–329. DOI: 10.1007/978-3-030-77957-3_16.

[B3] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Response of monumental buildings to internal explosions". In: *7th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*. Ed. by M Papadrakakis and M Fraiadakis. Crete, Greece (short version of [11]), 24-26 June 2019. DOI: 10.7712/120119.6958.19630.

[B4] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Bertier. "Rocking response and overturning of museum artefacts due to blast loading (**invited keynote**)". In: *7th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*. Ed. by M Papadrakakis and M Fraiadakis. Crete, Greece (application of the theory developed in [8]), 24-26 June 2019. DOI: 10.7712/120119.7119.19577.

4.4 Other international publications

[C1] A Morsel, **F Masi**, I Stefanou, P Kotronis, G Racineux, and E Marché. "Reduced-scale testing of masonry structures to explosions (poster)". In: *34th Workshop ALERT Geomaterials*. Aussois, France, 25-27 September 2023.

[C2] A Morsel, **F Masi**, I Stefanou, and P Kotronis. "Design of reduced-scale experiments of masonry structures subjected to blast loads (poster)". In: *33rd Workshop ALERT Geomaterials*. Aussois, France, 26-28 September 2022.

[C3] **F Masi** and I Stefanou. "Thermodynamics-based Neural Networks: a general framework for modeling microstructured materials displaying path-dependency (poster)". In: *32nd Workshop ALERT Geomaterials*. Aussois, France (dissemination of [3]), 29 September-2 October 2021.

[C4] F Rabie, **F Masi**, and I Stefanou. "Thermodynamics-based Artificial Neural Networks for Nonlinear Seismic Analysis of High-rise Buildings (poster)". In: *32nd Workshop ALERT Geomaterials*. Aussois, France, 29 September-2 October 2021.

[C5] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "A Discrete Element Method approach for the preservation of the architectural heritage against explosions". In: *12th HSTAM International Congress on Mechanics*. Thessaloniki, Greece, 22-25 September 2019.

[C6] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Michelangelo's David or Aphrodite of Milos: Who is More Resistant to Blast Loads?" In: *12th HSTAM International Congress on Mechanics*. Thessaloniki, Greece (preliminary, short version of [7]), 22-25 September 2019.

4.5 Reviewed national conferences

[D1] **F Masi** and I Stefanou. "Réseaux de neurones artificiels basés sur la thermodynamique (TANN) pour la mécanique computationnelle et la modélisation multi-échelle". In: *25e Congrès Français de Mécanique*. Nantes, France (short version of [3] submitted as application to AFM's Paul Germain Prize), 29 August - 2 September 2022.

[D2] **F Masi**, I Stefanou, A Morsel, and P Kotronis. "Reduced-scaled experiments of masonry structures under blast loads". In: *25e Congrès Français de Mécanique*. Nantes, France (dissemination of [4]), 29 August - 2 September 2022.

[D3] G Piunno, **F Masi**, I Stefanou, and C Jommi. "Multi-scale modelling of natural composites via Thermodynamics-based Artificial Neural Networks". In: *25e Congrès Français de Mécanique*. Nantes, France, 29 August - 2 September 2022.

4.6 Conference communications

[E1] **F Masi**. "Unraveling the behavior of masonry structures under explosions and data-driven approaches for computational mechanics (**invited speaker**)". In: *15th colloque national en calcul des structures*. Giens, France, 16-20 May 2022.

[E2] **F Masi** and I Stefanou. "Data- and thermodynamics-driven discovery of state variables and evolution equations". In: *41st International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering*. Paris, France, 18-22 July 2022.

[E3] **F Masi** and I Stefanou. "Multiscale modeling of inelastic microstructured materials with TANN". In: *18th European Mechanics of Materials Conference*. Oxford, UK, 4-6 April 2022.

[E4] **F Masi** and I Stefanou. "Understanding the behavior of masonry structures subjected to blast loads". In: *2nd International Conference on Nonlinear Solid Mechanics*. Alghero, Italy, 13-16 June 2022.

[E5] **F Masi**. "Mechanics and Deep Learning for protecting cultural heritage against explosions (**invited speaker**)". In: *6th ECCOMAS Young Investigators Conference*. Valencia, Spain, 7-9 July 2021.

[E6] **F Masi** and I Stefanou. "Thermodynamics-based Artificial Neural Networks (TANN) and constitutive modeling". In: *Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology*. San Diego, CA, USA, 26-29 September 2021.

[E7] **F Masi** and I Stefanou. "Thermodynamics-based Artificial Neural Networks for the constitutive modeling of inelastic materials". In: *14th World Congress on Computational Mechanics*. Paris, France, 11-15 January 2021.

[E8] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Micro-modelling of masonry structures under blast loads via a Discrete Element Method approach". In: *14th World Congress on Computational Mechanics*. Paris, France, 11-15 January 2021.

[E9] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Masonry vaults under explosive loads". In: *7th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*. Crete, Greece, 24-26 June 2019.

[E10] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Étude de la réponse structurale de structures à géométrie complexe aux explosions: le cas du Panthéon de Rome". In: *2e Édition des Jounées Nationales Maçonnerie*. Marne-la-Vallée, France, 22-23 March 2018.

[E11] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Simulations of blast effects in monumental structures". In: *13th World Congress on Computational Mechanics*. New York, NY, USA, 22-27 July 2018.

[E12] **F Masi**, I Stefanou, P Vannucci, and V Maffi-Berthier. "Une approche non-linéaire pour l'étude de la résistance au vent d'une cathédrale gothique: Notre Dame de Paris". In: *2e Édition des Jounées Nationales Maçonnerie*. Marne-la-Vallée, France, 22-23 March 2018.

4.7 Research reports

[F1] **F Masi**. "Fast-dynamic response and failure of masonry structures of non-standard geometry subjected to blast loads". PhD thesis. École centrale de Nantes, 2020. URL: https://theses.hal.science/tel-03217357.

[F2] P Vannucci, I Stefanou, and **F Masi**. *Structural integrity of Notre Dame Cathedral after the fire of April 15th, 2019*. Tech. rep. Paris: UVSQ-ENPC, 2019. URL: https://hal.archives-ouvertes.fr/hal-02105786v2.

[F3] P Vannucci, **F Masi**, and I Stefanou. *A comparative study on the effects of blast actions on a monumental structure*. Tech. rep. Paris: UVSQ-ENPC, 2017. URL: https://hal.science/hal-01720557.

[F4] P Vannucci, I Stefanou, and **F Masi**. *Cathédrales Durables (classified: Confidentiel Défense)*. Tech. rep. Paris: CNRS, 2017.

4.8 Invitations to workshop and seminars

– Invited lecture, 3SR Laboratory, UGA, Grenoble, France, 28 Feb 2023.

– Invited lecture, "Physics-based neural constitutive equations," Hybrid Computational Methods in Geotechnics, The University of Melbourne, Australia, 27 April 2023.

– Invited lecture, "A la (re-)découverte des lois de comportement par la Thermodynamique et l'Intelligence Artificielle," *IA: Approches et intérêt pour l'étude des CMC – Atelier,* Groupement de Recherche $(CMC)^2$, ENS Paris-Saclay, 17 March 2023.

– Invited lecture, "Thermodynamics-based Artificial Neural Networks," Inria TAU team, Paris-Saclay, France, 28 Febraury 2023.

– Invited lecture, "Data- and thermodynamics-driven discovery of constitutive equations," ISSMGE TC309 Technical Forum of Young Scholars on Data-driven Modelling of Soil Behaviours with Geotechnical Applications, Hong Kong Polytechnic University, 25 November 2022.

– Invited lecture, "Thermodynamics- and data-driven discovery of constitutive equations," Navier Laboratory, École des Ponts ParisTech, Marne-la-Vallée, France, 14 October 2022.

– Invitation to workshop, "Deep learning, simulation temps réel et réduction de modèles," 5e Workshop Computational Structural Mechanics Association (CSMA) Junior. Giens, France, 14-16 May 2022.

– Invited lecture, "How Machine Learning can help in earthquake control and fault mechanics?," Crunch Machine Learning + X Seminars, Brown University, Division of Applied Mathematics, 12 November 2021.

– Invited lecture, "Can we tame earthquakes?," Data-centric engineering, The University of Sydney, 27 October 2021.

4.9 Software development and other realisations

Software developed along my research activities and self-evaluated according to the guidelines.

– **TANN**: "Thermodynamics-based Artificial Neural Networks"
`Family=research`, `Audience=community`, `Evolution=lts`, `Duration=3` (years), `Contribution=leader`
`url=github.com/filippo-masi/Thermodynamics-Neural-Networks`
A compilation of Python scripts that I coded in implementing Thermodynamics-based Artificial Neural Networks (TANN) for the identification of behaviour equations. The repository collects data sets, pre-processing, and learning algorithms utilising Tensorflow and PyTorch libraries and it is mainly devoted to the validation of the results presented in [5].

– **DLworkshop**: "Workshop on Deep Learning and constitutive modelling"
`Family=vehicle`, `Audience=community`, `Evolution=basic`, `Duration=2` (years), `Contribution=leader`
`url=github.com/filippo-masi/CSMA-Workshop-in-Deep-Learning`
A comprehensive repository containing all relevant materials, codes, and presentation from the 5^{th} workshop of CSMA Junior (Computational Structural Mechanics Association) held in Porquerolles Island, France, on 14-15 May 2022. Targeted at young scholars, it provides Python scripts and Jupyter notebooks for differentiating between black-box and physics-based approaches for material modelling and explains the bases to build artificial neural networks for constitutive modelling via tutorials and benchmarks of increasing difficulty.

– **TANN-multiscale**: "Multiscale modeling of inelastic materials with TANN"
`Family=research`, `Audience=team`, `Evolution=lts`, `Duration=1` (year), `Contribution=leader`

`url=github.com/filippo-masi/TANN-multiscale`
The repository collects Python scripts necessary for the validation of the benchmarks presented in [3] and is composed of two parts. The former is the implementation of a Finite Element code for simulating the response of lattice materials and structures, under several type of prescribed boundary conditions (periodic, Neumann, Dirichlet). The latter is a hands-on for performing Finite Element analyses using TANN as a user-material, relying on the open-source platform FEniCS.

– **Hands-on-ALERT**: "Hands-on regression methods and physics-informed machine learning"
`Family=vehicle`, `Audience=community`, `Evolution=basic`, `Duration<=1`, `Contribution=leader`
`url=github.com/alert-geomaterials/2023-doctoral-school/main/chapters/hands-on/C02; /C09`
Hands-on examples and exercises from ALERT Geomaterials Doctoral School on "Machine Learning in Geomechanics" (2023), and in particular the two courses I gave on regression methods (linear and nonlinear regression, regularisation techniques and their applications in finding parsimonious governing equations) and physics-informed neural networks [A2, A1].

– **NICE**: "Neural Integration for Constitutive Equations"
`Family=research`, `Audience=community`, `Evolution=lts`, `Duration<=1`, `Contribution=leader`
`url=github.com/filippo-masi/NICE`
This library provides the implementation in PyTorch of the Neural Integration for Constitutive Equations (NICE) approach and the benchmarks necessary for the validation of the corresponding research output [1]. The algorithms are implemented using PyTorch and torchdiffeq libraries.

– **h2plasticity**: "h^2 plasticity constitutive models"
`Family=utility`, `Audience=partners`, `Evolution=basic`, `Duration=3`, `Contribution=leader`
`url=github.com/filippo-masi/h2plasticity`
A Python-based implementation, available as Jupyter notebooks, of h^2-plasticity constitutive models.

5 SUPERVISION AND TEACHING

5.1 Supervision

– **PhD students**

Ahmad Morsel (01/2021 – present) – PhD candidate (expected oral examination: 30 March, 2024) at École Centrale de Nantes. PhD in the frame of BLAST (Blast LoAds on STructures) – Connect Talent project, funded by Pays de la Loire and Nantes Metropole. Subject: Experimental testing of masonry structures subjected to extreme loads. Amount of supervision: 30% (in collaboration with Ioannis Stefanou and Panagiotis Kotronis). Significance of the work: Through this research, a unique platform for performing reduced-scale experiments of structures under blast loads is being designed. The experiments will convey valuable information for current state-of-the-art knowledge in modelling the fast-dynamic response of blocky structures.

– **Master students**

Enzo Louvard (02/2024 – present) – Master intership at The University of Sydney, in collaboration with ENS Paris-Saclay. Subject: Neural constitutive equations for material model discovery from small data. Amount of supervision: 100%. Expected oral examination: June, 2024.

Farah Rabie (02/2021 – 08/2021) – Master internship at École Centrale de Nantes, in the frame of CoQuake (Controlling earthQuakes) – European Research Center (ERC) Starting Grant. Subject: Thermodynamics-based Artificial Neural Networks for nonlinear seismic analysis of high-rise buildings. Amount of supervision: 60% (in collaboration with Ioannis Stefanou). Significance of the work: This work concerns the application of Thermodynamics-based Neural Networks to high-rise buildings, with a in-depth study of machine learning models (in particular deep Learning and model order reduction methods). The study proposed an alternative way to otherwise computationally expensive seismic analyses of civil infrastructures.

Barbara Abougaye (02/2020 – 08/2020). Master internship at École Centrale de Nantes. Subject: Scaling laws for the material response under impact loading. Amount of supervision: 60% (in collaboration with Ioannis Stefanou). Significance of the work: During this internship, literature review and preliminary studies were carried on the derivation of scaling laws for the material behaviour under impact loading.

5.2 Teaching experience

- **ALERT Geomaterials Doctoral School** (2023)
  Courses: "Introduction to Regression Methods" and "Physics-Informed and Thermodynamics-Based Neural Networks" (`github` and `alertgeomaterials.eu`).
- **École Centrale de Nantes** (2020-2023)
  Courses: Undergraduate "Continuum Mechanics" (problem solutions assistance) and Master's "Experimental Imaging Analysis for Engineers" (full responsibility, 2020 to 2022).
- **École des Ponts** (2018-2020)
  Courses: Undergraduate "Computational Mechanics" and "Advanced Computational Mechanics".

6 SERVICE

6.1 Responsibilities

- Invited reviewer for the following international scientific journals: Comput Mech – Comput Methods Appl Mech Eng – Comput Geotech – Def Technol – Exp Mech – Eur J Mech A Solids – Géotechnique – Int J Mech Sci – Int J Numer Anal Methods Geomech – Int J Numer Methods Eng – J Mech Phys Solids – Strain.
- Co-organizer of the Minisymposium entitled Scientific Machine Learning techniques for complex engineering systems on the occasion of the 2023 ECCOMAS Young Investigators Conference (YIC2023), held in Porto, Portugal (19-21 June, 2023).
- Member of the Direction Board of GeM laboratory, École Centrale de Nantes (2022).
- Committee member of AustraliaN Association for GRAnular Media (ANAGRAM) (11/2023 – present)

6.2 Dissemination of scientific knowledge

- Coordinator of the "*Explosions, vibrations et patrimoine*" workshop (with Ahmad Morsel, Ioannis Stefanou, Panagiotis Kotronis, Guillaume Racineux, Emmanuel Marché), on the occasion of the 2023 edition of the *Nuit Blanche des Chercheur.es* event hosted by Nantes Université (short video).
- Blog on my PhD experience under the form of an interview to outreach young generations about academia, industry, and international exchanges, published by *Docteurs Sciences pour l'Ingénieur*, in July 2022.
- Ambassador of DECLICS Association: *Dialogues Entre Chercheurs et Lycéens pour les Intéresser à la Construction des Savoirs*, 2020-2022.
- Webinar for a wide professional (civil engineering) public: "*Comportement des structures maçonnées à l'explosion*," Ingérop, 29 October, 2020.

6.3 Transfer of knowledge

- Beneficiary: Ingérop, "Structures et calculs scientifiques" service
  During my CIFRE PhD thesis, I engaged in knowledge and skills transfer, focusing on blast loading, structural modelling, and simulation, to the "Structures et calculs scientifiques" at Ingérop.[1] This transfer was a gradual process over my three-year PhD (2017-2020). I provided consistent updates on my research and its advancements. Additionally, I supported ongoing industrial projects that benefited from my developing expertise. I significantly contributed to advancing knowledge and skills in blast loading modelling, simulation, and machine data-driven material modelling. I developed codes, validated them through benchmarks, and maintained weekly meetings and wrote internal reports to update the team on research progress. The beneficiary was able to apply this advanced knowledge in various industrial projects, leading to an increase in project involvement over the three-year period. Moreover, the beneficiary leveraged these results to establish new industrial collaborations, participate in new projects, engage with additional academic partners (including an internship), and disseminate achievements through a published report and a webinar.

[1] Details of the beneficiary: Ingérop, 18 Rue des 2 Gares, 92500 Rueil-Malmaison, France – responsible: François Lacroix (Ingérop's scientific and technical director), Victor Maffi-Berthier (previously service's head), Mahsa Mozayan Kharazi (current service's head).