Enrico Chinchella

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About me: I have recently competed my PhD, focused on two different aspects of precipitation measurements. Firstly the evaluation of wind induced biases in measurements obtained from innovative non-catching type precipitation gauges, using numerical models to perform CFD and particles tracking. Secondly the implementation of a calibration procedure and the construction of a device capable of reproducing the hydrometeors sizes and velocities typical of a natural rainfall event. I'm currently working as postdoc at the University of Genova focussing on urban flooding hazard modelling and data collection using innovative sensors. I'm also working on publishing the work I've completed during my PhD.

EDUCATION AND TRAINING

02/11/2022 – CURRENT – Via Montallegro 1, Genova, Italy
POSTDOCTORAL RESEARCHER - University of Genoa, Department of Civil, Chemical and Environmental Engineering

POSTDOC activities: Currently working on the development of an innovative precipitation gauge using opportunistic measurements from moving vehicles and on numerical modelling of urban flood hazard due to failure in the surface drainage system as a continuation of the RUN project "Resilienza Urbana: Now-casting del rischio di allagamento con sensori IoT e Open Data" from Piano Operativo Regionale (POR) 2014-2020 of Liguria region.

01/11/2019 - 23/05/2023 - Via Montallegro 1, Genova, Italy
PHD DEGREE - University of Genoa, Department of Civil, Chemical and Environmental Engineering

Curriculum in Fluid Dynamics and Environmental Engineering XXXV cycle, with a thesis titled: Bluff-body aerodynamics and transfer functions for non-catching precipitation measurement instruments. Available at: https://hdl.handle.net/11567/1117802

PhD project: Evaluation and correction of wind induced bias in field measurements from innovative precipitation gauges of the non-catching type kind using fluid computational fluid dynamics modelling and particles tracking. Concurrent development of calibration procedure and a calibration apparatus for non-catching type precipitation gauges, capable of reproducing natural occurring raindrops and independently verifying them.

Research interest:
- Computational fluid dynamics
- Precipitation measurements
- Prototype development

01/11/2015 - 29/10/2019 - Via Montallegro 1, Genova, Italy
MASTER DEGREE - University of Genoa, Department of Civil, Chemical and Environmental Engineering

Field of study:	Civil and environmental engineering (LM-35)
Final vote:	110/110 cum laude
Thesis:	Evaluation of wind-induced errors for the Hotplate precipitation gauge using CFD simulations

01/11/2012 - 31/03/2016 - Via Montallegro 1, Genova, Italy
BACHELOR DEGREE - University of Genoa, Department of Civil, Chemical and Environmental Engineering

Field of study:	Civil and environmental engineering (L-7)
Final vote:	101/110
Thesis:	Integrated survey with total station and GNSS in support of photogrammetric and laser scanner

RESEARCH ACTIVITIES

Participation in research projects:
- **01 February 2022 – 30 April 2023** Collaborating on the topic of flood hazard modelling in urban areas caused by failure in the urban drainage system, as part of the RUN project "Resilienza Urbana: Now-casting del rischio di allagamento con sensori IoT e Open Data" from Piano Operativo Regionale (POR) 2014-2020 of Liguria region.

- **01 November 2019 – 30 June 2022** Part of the EURAMET (European Association of Metrology Institutes) 18NRM03 titled "INCIPIT – Calibration and accuracy of non-catching instruments to measure liquid/solid atmospheric precipitation". The project was co-founded from the member states of the EMPIR (European Metrology Programme for Innovation and Research) programme and from the Horizon 2020 programme, research and innovation of EU.

- **23 July 2020 – 23 April 2021** Part of the CINECA-ISCRA project, titled "CATCHLES – Scale resolving CFD simulations and particle tracking for non-catching type precipitation gauges"

- **13 October 2021 – 13 July 2022** Part of the CINECA-ISCRA project, titled "LESRAIN – LES-based particle tracking for non-catching rain gauges"

Papers:

- *Chinchella, E., Cauteruccio, A., Stagnaro, M., & Lanza, L. G. (**2021**). Investigation of the Wind-Induced Airflow Pattern Near the Thies LPM Precipitation Gauge. Sensors, 21(14), 4880.*

- *Cauteruccio, A., Chinchella, E., Stagnaro, M., & Lanza, L. G. (**2021**). Snow Particle Collection Efficiency and Adjustment Curves for the Hotplate Precipitation Gauge. Journal of Hydrometeorology, 22(4), 941-954.*

- *Lanza, L. G., Merlone, A., Cauteruccio, A., Chinchella, E., Stagnaro, M., Dobre, M., ... & Parrondo, M. (**2021**). Calibration of non-catching precipitation measurement instruments: A review. Meteorological Applications, 28(3), e2002.*

- *Baire, Q., Dobre, M., Piette, A. S., Lanza, L., Cauteruccio, A., Chinchella, E., ... & Garcia Izquierdo, C. (**2022**). Calibration Uncertainty of Non-Catching Precipitation Gauges. Sensors, 22(17), 6413.*

- *Cauteruccio, A.,Chinchella, E., & Lanza, L. G. (**2023**). The Overall Collection Efficiency of Catching-type Precipitation Gauges in Windy conditions. Water Resources Research, Submitted.*

- *Chinchella, E., Cauteruccio, A., & Lanza, L. G. (**2023**). The impact of wind on precipitation measurements from a compact piezoelectric sensor. Atmospheric Measurement Techniques, Submitted.*

Memories at conferences:

- *Chinchella, E., Cauteruccio, A., Stagnaro, M., Freda, A. and L.G. Lanza (**2020**). CFD simulation to assess the collection efficiency of the hotplate precipitation gauges. Proc. XXXVII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Online Edition, 14 – 16 Giugno 2021.*

- *Chinchella, E., Cauteruccio, A., Stagnaro, M. and L.G. Lanza, (**2022**). Assessing the Thies LPM aerodynamic behaviour using CFD simulation and wind tunnel experiments. XXXVIII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Reggio Calabria, settembre 2022, (accepted).*

Abstract:

- *Stagnaro, M., Chinchella, E., Cauteruccio, A. and L.G. Lanza (**2020**). Bluff body aerodynamics of the Thies Laser Precipitation Monitor investigated using CFD and wind tunnel measurements. EGU General Assembly, Geophys. Res. Abstr., 22, 18803.*

- *Chinchella, E., Cauteruccio, A., Stagnaro, M. and L.G. Lanza (**2020**). Evaluation of wind-induced errors for the Hotplate precipitation gauge using computational fluid dynamic simulations. EGU General Assembly, Geophys. Res. Abstr., 22, 21543.*

- *Chinchella, E., Cauteruccio, A., Stagnaro, M. and L.G. Lanza (**2021**). The wind-induced bias of the Thies Laser Precipitation Monitor obtained using CFD and a Lagrangian particle tracking mode. EGU General Assembly, Geophys. Res. Abstr., 23, 10750.*

- *Chinchella, E., Cauteruccio, A., Stagnaro, M. and L.G. Lanza (**2022**). Computational Fluid Dynamics and wind tunnel investigation of the aerodynamic response of the Thies LPM©. WMO/CIMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (CIMO TECO-2020, postponed TECO-2022, Parigi, 10-13 ottobre 2022).*

- *Chinchella, E., Stagnaro, M., Cauteruccio A. and L.G. Lanza (**2022**). A precision raindrop generator to calibrate non-catching rain gauges. EGU General Assembly, Geophys. Res. Abstr., EGU22-7339.*

- *Chinchella, E., Cauteruccio, A., Stagnaro, M. and L.G. Lanza (**2022**). A calibration device for non-catching rain gauges. WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2022), Parigi, 10-13 ottobre 2022.*

- *Merlone, A., Musacchio, C. , Coppa, G. , Lanza, L.G., Cauteruccio, A., Chinchella, E., Roulet Y.-A., Dobre, M., Baire, Q., Piette, A.-S., Nielsen, J., Kjeldsen, H., Østergaard, P., García Izquierdo, C., Parrondo, M, Kowal A (**2022**). The INCIPIT project: calibration and accuracy of non-catching instruments to measure liquid/solid atmospheric precipitation. WMO/CIMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (CIMO TECO-2020, postponed TECO-2022, Parigi, 10-13 ottobre 2022).*

- Chinchella, E., Cauteruccio, A., & Lanza, L. G. (2023). Assessing the wind-induced bias for an impact disdrometer using numerical simulation and wind tunnel experiments (No. EGU23-7215). Copernicus Meetings.

- Lanza, L. G., Cauteruccio, A., & Chinchella, E. (2023). Opportunistic rain sensors and flood modelling to assess the risk of failure of surface drainage in urban areas (No. EGU23-9567). Copernicus Meetings.

TEACHING AND TRAINING COURSES

- **Teaching assistance for a total of 60 hours** during the a.y. 2021-2022 and a.y. 2022-2023 for the course of “Infrastrutture Idrauliche Urbane” offered by the bachelor course in civil and environmental engineering (L-7) at UNIGE.
- **Teaching assistance for a total of 30 hours** during the a.y. 2021-2022 and a.y. 2022-2023 for the course of “Hydraulic Systems Design” offered in english by the master course civil engineering (LM-23) and environmental engineering (L-35) at UNIGE.
- **a.y. 2021-2022 and a.y. 2022-2023** part of the exam commission for the course “Infrastrutture Idrauliche Urbane” offered by the bachelor course in civil and environmental engineering (L-7) at UNIGE.
- **a.y. 2021-2022 and a.y. 2022-2023** part of the exam commission for the course “Hydraulic Systems Design” offered in english by the master course civil engineering (LM-23) and environmental engineering (L-35) at UNIGE.
- **Cauteruccio, A. & Chinchella E. (2022)**. Lecture on:
  Electrical installation and data collection of a drop counting precipitation gauge, for the for the staff of the Italian meteorological service of Aeronautica Militare – technical centre for meteorology, Genova 17 may 2022.
- **Cauteruccio, A. & Chinchella E. (2022)**. Training activities for the ETG s.r.l staff at the pluviometry laboratory of WMO Lead Centre “B. Castelli” on Precipitation Intensity at DICCA in the context of the contract stipulated with DICCA. Genova, 7 june 2022.
  Specifically, the following activities were performed:
  - Evaluation of performances of a field calibration device for catching type precipitation gauges;
  - Designing aid for a new prototype of tipping bucket developed by ETG, evaluating performances following the European norm UNI EN 17277:2020.
- **Chinchella E. & Cauteruccio A. (2022).** Training and technical activities for the ETG s.r.l. staff at the company site in the context of the contract stipulated with DICCA. Scandicci (FI), 21 july 2022.
  Specifically, the following activities were performed:
  - Installation of a laboratory calibration device for catching type precipitation gauges;
  - Training in the use of the calibration device and on the accompanying software;
  - Hands on testing and data visualization following the UNI EN 17277:2020.
- **LabVIEW Core 1:** course offered by National Instrument for a duration of 27 hours completed on 09/03/2023.

COLLABORATIONS

Design and construction of a laboratory calibration device for catching type precipitation gauges for the ETG s.r.l. company in the context of the contract stipulated with DICCA.

Professional collaboration with 'StudioTreIng' in Chiavari for urban flooding modelling in the municipality of Cogorno.

LANGUAGE SKILLS

Native language: ITALIAN
Other language(s):

	UNDESTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	B1	B1	C1

DIGITAL SKILLS

Proficient in the following software and programming languages:
Microsoft Office | OpenFOAM | HEC-RAS | MATLAB | Fusion360 | LabVIEW | GRASS | QGIS | Photoshop | Ansys Fluent | Python | LaTex | Linux | AutoCAD |