

# Pasquale Trinchese

curriculum vitae



## Personal Information

**Name:** Pasquale Trinchese

**Address:**

**Phone:**

**e-mail:**

**pec:**

**Nationality:** Italian

**Place of birth:**

**Date of birth:**

**Driving license:**

## Experience

**CEO**, ESTHAR S.R.L., Camposano, Napoli, Italy 2021-now  
CEO and founder @ [Esthar s.r.l.](#)

**Research Fellow**, Università degli Studi di Napoli Federico II, Napoli, Italy 2021  
Augmented Reality for Crime Scene Tagging.

**IT Consultant**, ERICSSON, Camposano, Napoli, Italy 2021  
Python developer.

**IT Administrator**, DARES s.r.l.s., Casamarciano, Napoli, Italy 2016-2021  
Director of information systems, computer consultant.

**Guest Researcher**, CITIC, University of Granada, Granada, Spain 2019  
Development of machine learning and optimization algorithms for Brain Computer Interfaces.

**Cooperation Associate**, CERN, Geneve, Switzerland 2018  
Development of a robotic arm with a SSVEP-based Brain Computer Interface (BCI) using Augmented Reality stimuli.

**Software Engineer**, SALVER s.p.a., Brindisi, Italy 2018  
Analysis software for polymerization cycles in industrial autoclaves.

**Hardware Engineer**, DARES s.r.l.s., Casamarciano, Napoli, Italy 2018  
Infrared-triggered precision chronometer development.

**Research Fellow**, INFN, Napoli, Italy 2017  
R&D towards high sensitivity detectors for dark matter searches with noble liquids. Development of a liquid Argon time projection chamber prototype data acquisition system allowing for real time event reconstruction.

**Software Engineer**, SALVER s.p.a., Brindisi, Italy 2017  
Development of thickness reconstruction software for non-destructive testing of aerospace parts.

**Hardware Engineer**, DARES s.r.l.s., Casamarciano, Napoli, Italy 2017  
Development of thermocouple data-logger device with remote monitoring interface.

**Hardware Engineer**, DARES s.r.l.s., Casamarciano, Napoli, Italy 2016  
Development of optical box for uniform illumination of aerospace components during inspection procedure.

**Undergraduate Fellow**, INFN, Napoli, Italy 2016  
Characterization of novel Silicon Photomultipliers (SiPM) at cryogenic temperatures. Design, assembly and operation of a cryogenic test station to verify the robustness of the SiPMs at LAr temperature.

**Guest Researcher**, Dep. of Physics, Princeton University, NJ, USA 2014  
Acquisition and analysis of dark matter data within the DarkSide experiment. Determination of background from alpha particles from the inner surfaces of the DarkSide-50 liquid argon time projection chamber.

**Part Time Training**, Laboratories of Cisterna di Latina, Roma, Italy 2012  
Simulations of deformations of elastic materials and heat diffusion in poroelastic materials with Comsol Multiphysics.

## Education

**Philosophiae Doctor (Ph.D.)**, Dep. of Physics, Università degli Studi di Napoli Federico II, Italy 2021  
SSD INF/01  
Subject of the dissertation: A portable EEG-BCI framework enhanced by machine learning techniques. Supervisor: [Giovanni Acampora](#), [Autilia Vitiello](#).

**Master of Science (M.Sc.)**, 108/110, Dep. of Physics, Università degli Studi di Napoli Federico II, Italy 2017  
Specialized curriculum in Physics. Three-months stay as guest researcher at the Princeton University. Subject of the dissertation: Study of Silicon Photomultipliers for the DarkSide Experiment. Supervisors: [Giuliana Fiorillo](#), [Biagio Rossi](#).

**Bachelor of Science (B.Sc.)**, 90/110, Dep. of Physics, Università degli Studi di Napoli Federico II, Italy 2013  
General curriculum in Physics. Subject of the dissertation: Caratterizzazione di rivelatori veloci per il tagging di fasci radioattivi. Supervisors: [Elio Rosato](#), [Ivano Lombardo](#).

**High School Diploma Degree (HSDG)**, Natural Sciences, Nola, Italy 2008

## Courses

**Business Analytics for Decision Making**, University of Colorado Boulder 2020

**Introduction to Food and Health**, Stanford University School of Medicine 2020

**Evolutionary Computation and Applications**, Università degli Studi di Napoli Federico II, Italy 2019

**Quantum Computing and Artificial Intelligence**, Università degli Studi di Napoli Federico II, Italy 2018

**Gorini Ph.D. School**, CERN, Switzerland Sep 2018

**LabView Core 1**, Università degli Studi di Napoli Federico II, Italy 2017

**Neapolis Innovation Summer Campus** on microcontrollers and real time operating systems, STMicroelectronics, Arzano, Italy Sep 2016

**Dark Matter Master Class**, Università degli Studi di Napoli Federico II, Italy Oct 2014

## Computer and Electronics skills

**Programming languages and tools**: C, C++, ROOT-CERN framework, Java, Android, Unity (C#), Matlab, VHDL, Docker, Python, Django, Lua, Labview, Bashscript and web development (php, javascript, html, MySql).

**Physics simulation**: Comsol Multiphysics.

**Electronics and PCB design**: Altium, Orcad, LTSpice

**CAD and 3D modeling**: Blender, Sketchup, Maya, Rhinoceros.

**Microcontrollers, microprocessors and programmable logic**: FPGA, PLC, Arduino, STMicroelectronics MCU, Raspberry Pi, PIC, ESP8266/ESP8285/ESP32.

**Desktop publishing**:  $\LaTeX$ , BibTeX, Microsoft Office, LibreOffice

## Languages

Mother tongue  
Other languages<sup>1</sup>

Italian

English  
Spanish  
Chinese

| Understanding |             | Speaking    |             | Writing     |
|---------------|-------------|-------------|-------------|-------------|
| Listening     | Reading     | Interaction | Production  |             |
| Fluent        | Fluent      | Independent | Independent | Independent |
| Independent   | Independent | Independent | Independent | Independent |
| Beginner      | Beginner    | Beginner    | Beginner    | Beginner    |

## Personal interests

Science, Electronics, Technology, Languages, Communication, Politics, Traveling, Music, Martial Arts.

## Presentations and Congresses

- [1] Classifying EEG Signals in Single-Channel SSVEP-based BCIs through Support Vector Machine  
IEEE International Conference on Systems, Man, and Cybernetics (SMC), Toronto, Ontario, Canada, 11-14 Oct 2020
- [2] Applying Logistic Regression for Classification in Single-Channel SSVEP-based BCIs  
IEEE International Conference on Systems, Man and Cybernetics (SMC), Bari, Italy, 6-9 Oct 2019
- [3] SiPMs analysis  
Darkside Collaboration Meeting, GSSI L'Aquila, Italy, 20-24 Feb 2017
- [4] DarkSide-20k: rivelatore per la ricerca diretta di materia oscura  
Società Italiana di Fisica, 102° Congresso Nazionale, Padova, Italy, 26-30 Sept 2016
- [5] SiPM test station in Napoli  
Darkside General Meeting, Pula, Italy, 12-16 Jun 2016

## Publications

### Peer-reviewed journals

- [1] A Dataset of EEG signals from a single-channel SSVEP-based Brain Computer Interface  
Giovanni Acampora, Pasquale Trinchese, Autilia Vitiello  
*Data in Brief* (2021) p. 106826. 2021. doi: <https://doi.org/10.1016/j.dib.2021.106826>
- [2] Effective field theory interactions for liquid argon target in DarkSide-50 experiment  
P. Agnes, other  
*Phys. Rev. D* 101 (6 Mar. 2020) p. 062002. 2020. doi: [10.1103/PhysRevD.101.062002](https://doi.org/10.1103/PhysRevD.101.062002)
- [3] Measurement of the ion fraction and mobility of <sup>218</sup>Po produced in <sup>222</sup>Rn decays in liquid argon  
P. Agnes  
*JINST* 14.11 (Nov. 2019) P11018–P11018. IOP Publishing, 2019. doi: [10.1088/1748-0221/14/11/p11018](https://doi.org/10.1088/1748-0221/14/11/p11018)
- [4] Directional dark matter detection sensitivity of a two-phase liquid argon detector  
M Cadeddu  
*Journal of Cosmology and Astroparticle Physics* 2019.01 (2019) p. 014. 2019. doi: [10.1088/1475-7516/2019/01/014](https://doi.org/10.1088/1475-7516/2019/01/014)
- [5] Constraints on Sub-GeV Dark-Matter–Electron Scattering from the DarkSide-50 Experiment  
P. Agnes  
*Phys. Rev. Lett.* 121 (11 Sept. 2018) p. 111303. 2018. doi: [10.1103/PhysRevLett.121.111303](https://doi.org/10.1103/PhysRevLett.121.111303)
- [6] Low-Mass Dark Matter Search with the DarkSide-50 Experiment  
P. Agnes  
*Phys. Rev. Lett.* 121 (8 Aug. 2018) p. 081307. 2018. doi: [10.1103/PhysRevLett.121.081307](https://doi.org/10.1103/PhysRevLett.121.081307)
- [7] DarkSide-50 532-day dark matter search with low-radioactivity argon  
P. Agnes  
*Phys. Rev. D* 98 (10 Nov. 2018) p. 102006. 2018. doi: [10.1103/PhysRevD.98.102006](https://doi.org/10.1103/PhysRevD.98.102006)
- [8] Electroluminescence pulse shape and electron diffusion in liquid argon measured in a dual-phase TPC  
P. Agnes

- [9] The Electronics, Trigger and Data Acquisition System for the Liquid Argon Time Projection Chamber of the DarkSide-50 Search for Dark Matter  
P. Agnes  
*JINST* 12.12 (2017) P12011. 2017. DOI: [10.1088/1748-0221/12/12/P12011](https://doi.org/10.1088/1748-0221/12/12/P12011)
- [10] Simulation of argon response and light detection in the DarkSide-50 dual phase TPC  
P. Agnes  
*JINST* 12.10 (2017) P10015. 2017. DOI: [10.1088/1748-0221/12/10/P10015](https://doi.org/10.1088/1748-0221/12/10/P10015)
- [11] DarkSide-20k: A 20 tonne two-phase LAr TPC for direct dark matter detection at LNGS  
C. E. Aalseth  
*Eur. Phys. J. Plus* 133 (2018) p. 131. 2018. DOI: [10.1140/epjp/i2018-11973-4](https://doi.org/10.1140/epjp/i2018-11973-4)
- [12] Cryogenic Characterization of FBK RGB-HD SiPMs  
C. E. Aalseth  
*JINST* 12.09 (2017) P09030. 2017. DOI: [10.1088/1748-0221/12/09/P09030](https://doi.org/10.1088/1748-0221/12/09/P09030)
- [13] CALIS—A CALibration Insertion System for the DarkSide-50 dark matter search experiment  
P. Agnes  
*JINST* 12.12 (2017) T12004. 2017. DOI: [10.1088/1748-0221/12/12/T12004](https://doi.org/10.1088/1748-0221/12/12/T12004)
- [14] Effect of Low Electric Fields on Alpha Scintillation Light Yield in Liquid Argon  
P. Agnes  
*JINST* 12.01 (2017) P01021. 2017. DOI: [10.1088/1748-0221/12/01/P01021](https://doi.org/10.1088/1748-0221/12/01/P01021)
- [15] The Electronics and Data Acquisition System for the DarkSide-50 Veto Detectors  
P. Agnes  
*JINST* 11.12 (2016) P12007. 2016. DOI: [10.1088/1748-0221/11/12/P12007](https://doi.org/10.1088/1748-0221/11/12/P12007)
- [16] The veto system of the DarkSide-50 experiment  
P. Agnes  
*JINST* 11.03 (2016) P03016. 2016. DOI: [10.1088/1748-0221/11/03/P03016](https://doi.org/10.1088/1748-0221/11/03/P03016)
- [17] Results from the first use of low radioactivity argon in a dark matter search  
P. Agnes  
*Phys. Rev. D* 93.8 (2016) p. 081101. 2016. DOI: [10.1103/PhysRevD.93.081101](https://doi.org/10.1103/PhysRevD.93.081101)

## Peer-reviewed conferences and workshops

- [1] Classifying EEG Signals in Single-Channel SSVEP-based BCIs through Support Vector Machine  
G. Acampora, P. Trinchese, A. Vitiello  
*IEEE International Conference on Systems, Man, and Cybernetics*, 2020. DOI: [10.1109/SMC42975.2020.9282940](https://doi.org/10.1109/SMC42975.2020.9282940)
- [2] Applying Logistic Regression for Classification in Single-Channel SSVEP-Based BCIs  
G. Acampora, P. Trinchese, A. Vitiello  
*IEEE International Conference on Systems, Man, and Cybernetics*, 2019. DOI: [10.1109/SMC.2019.8914216](https://doi.org/10.1109/SMC.2019.8914216)
- [3] The DarkSide physics program and its recent results  
D D Angelo, P Agnes, L Agostino, IFM Albuquerque, T Alexander, AK Alton, K Arisaka, HO Back, B Baldin, K Biery  
*Nuovo Cimento C-Colloquia and Communications in Physics*, 2019
- [4] Status and Perspective of the DarkSide Experiment at LNGS  
P. Agnes  
*Proceedings, 31st Rencontres de Physique de La Vallée d'Aoste (La Thuile): La Thuile, Aosta , Italy, March 5-11, 2017*, 2017. DOI: [10.1393/ncc/i2017-17164-8](https://doi.org/10.1393/ncc/i2017-17164-8)
- [5] The DarkSide-50 Experiment: a Liquid Argon Target for Dark Matter Particles  
P. Agnes  
*Proceedings, 17th Lomonosov Conference on Elementary Particle Physics: Moscow, Russia, August 20-26, 2015*, 2017. DOI: [10.1142/9789813224568\\_0057](https://doi.org/10.1142/9789813224568_0057)
- [6] Recoil Directionality Studies in Two-Phase Liquid Argon TPC Detectors  
M. Cadeddu  
*EPJ Web Conf* 164 (2017) p. 07036. 2017. DOI: [10.1051/epjconf/201716407036](https://doi.org/10.1051/epjconf/201716407036)

- [7] The DarkSide Experiment: Present Status and Future  
G. Zuzel  
*Proceedings, 2nd International Conference on Particle Physics and Astrophysics (ICPPA 2016): Moscow, Russia, October 10-14, 2016, 2017.* DOI: [10.1088/1742-6596/798/1/012109](https://doi.org/10.1088/1742-6596/798/1/012109)
- [8] The DarkSide physics program and its recent results  
D. D'Angelo  
*Proceedings, 30th Rencontres de Physique de La Vallée d'Aoste: La Thuile, Aosta Valley, Italy, March 6-12, 2016, 2017.* DOI: [10.1393/ncc/i2016-16312-0](https://doi.org/10.1393/ncc/i2016-16312-0)
- [9] DarkSide  
B. Bottino  
*Proceedings, Neutrino Oscillation Workshop (NOW 2016): Otranto (Lecce), Italy, September 4-11, 2016, 2017.* DOI: [10.22323/1.283.0087](https://doi.org/10.22323/1.283.0087)
- [10] DarkSide-50: status of the detector and results  
Yann Guardincerri  
*Proceedings, 38th International Conference on High Energy Physics (ICHEP 2016): Chicago, IL, USA, August 3-10, 2016, 2016*
- [11] The DarkSide experiment  
B. Bottino  
*Proceedings, 15th Incontri di Fisica delle Alte Energie (IFAE 2016): Genoa, Italy, March 30-April 1, 2016, 2017.* DOI: [10.1393/ncc/i2017-17052-3](https://doi.org/10.1393/ncc/i2017-17052-3)
- [12] The DarkSide project  
P. Agnes  
*Proceedings, Light Detection in Noble Elements (LIDINE 2015): Albany, NY, USA, August 28-30, 2015, 2016.* DOI: [10.1088/1748-0221/11/02/C02051](https://doi.org/10.1088/1748-0221/11/02/C02051)
- [13] The DarkSide-50 outer detectors  
S. Westerdale  
*Journal of Physics: Conference Series* 718.4 (2016) p. 042062. 2016. DOI: [10.1088/1742-6596/718/4/042062](https://doi.org/10.1088/1742-6596/718/4/042062)
- [14] The DarkSide program at LNGS  
S. Davini  
*Proceedings, 51st Rencontres de Moriond, Cosmology session: La Thuile, Italy, March 19-26, 2016, 2016*
- [15] The DarkSide awakens  
S. Davini  
*Journal of Physics: Conference Series* 718.4 (2016) p. 042016. 2016. DOI: [10.1088/1742-6596/718/4/042016](https://doi.org/10.1088/1742-6596/718/4/042016)

#### DICHIARAZIONE SOSTITUTIVA DI CERTIFICAZIONE (art. 46 e 47 D.P.R. 445/2000)

Il sottoscritto Pasquale Trinchese, nato ad Atripalda (Av) il 21/01/1990 e residente in via Madonnella 1, 80030 Camposano (Na), ai sensi e per gli effetti degli articoli 46 e 47 e consapevole delle sanzioni penali previste dall'articolo 76 del D.P.R. 28 dicembre 2000, n. 445 nelle ipotesi di falsità in atti e dichiarazioni mendaci, dichiara la veridicità delle informazioni riportate nel presente curriculum vitae e il possesso di tutti i titoli in esso contenuti.

Luogo e data, Camposano, 05/01/2023

Il dichiarante, 