# next_AIM
## [INFN-CSN5 2022-2024]

## Project overview

*Alessandra Retico*
*Istituto Nazionale di Fisica Nucleare*
*Sezione di Pisa*
*alessandra.retico@pi.infn.it*

*next_AIM general meeting meeting - Milano, 13-15 Febbraio 2023*

# The Artificial Intelligence in Medicine (AIM) INFN Project

[INFN, CSN5, 2019-2021]

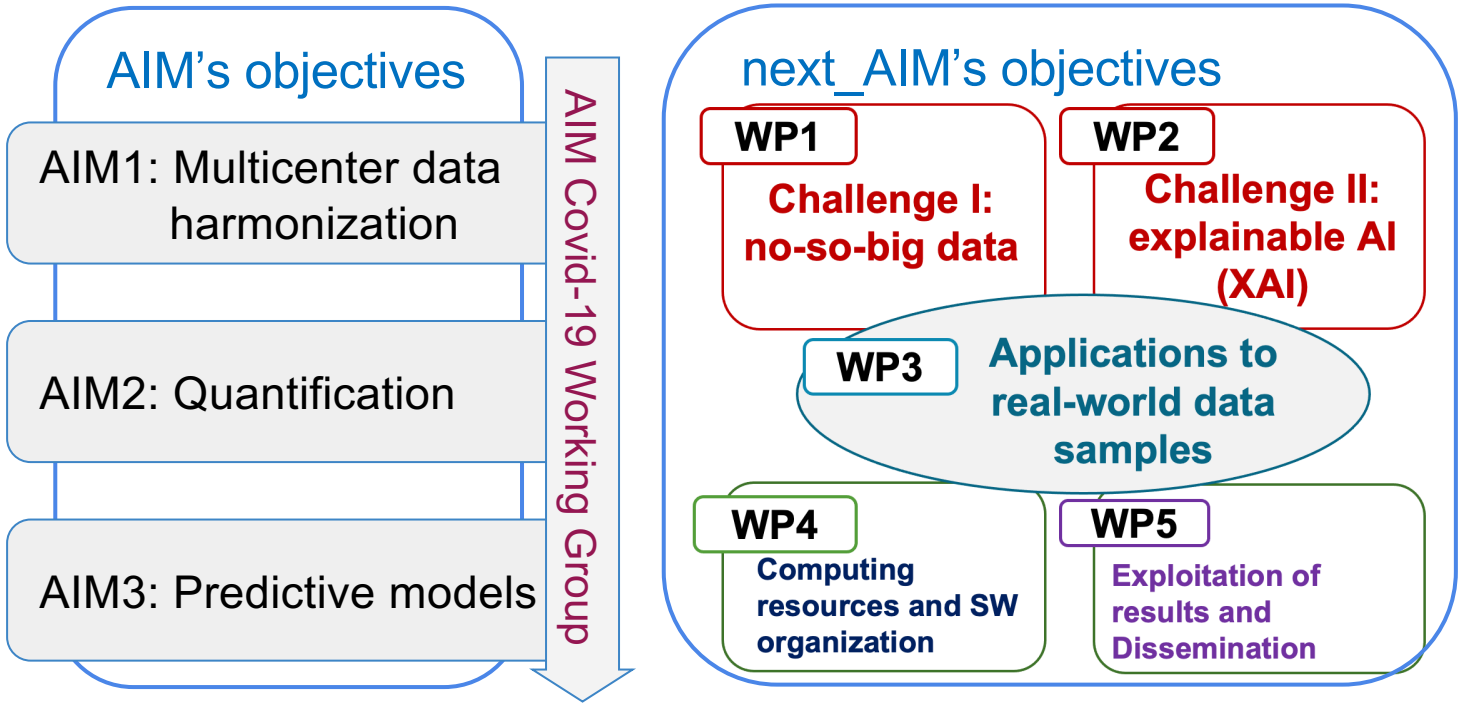
**Principal Invest.: A. Retico**

Research Units:

- Bari (S. Tangaro)
- Bologna (D. Remondini)
- Cagliari (P. Oliva)
- Catania (M. Marrale)
- Firenze (C. Talamonti)
- Genova (A. Chincarini)
- Lab. Naz. Sud (G. Russo)
- Milano (C. Lenardi)
- Napoli (G. Mettivier)
- Pavia (A. Lascialfari)
- Pisa (M.E. Fantacci)

**Artificial Intelligence** to become the next revolution in **medical diagnostics** and **therapy**.

- New image processing and data analysis strategies, including radiomics approaches, need to be developed and extensively validated.




Long-standing collaboration with Italian centers (hospitals / IRCCS) and with international consortia for data sharing

[INFN, CSN5, 2022-2024]

**Principal Invest.: A. Retico**

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- Pavia (A. Lascialfari)
- Padova (A. Zucchetta)
- Pisa (M.E. Fantacci)

# The Artificial Intelligence in Medicine (AIM) INFN Project

Researchers from INFN divisions and University Departments collaborate closely with Radiologists, Clinicians and Medical Physicists in Clinical Centers to develop innovative solutions based on data mining and AI

**Clinical partners**

- IRCCS S. Martino (GE)
- IRCCS Stella Maris (PI)
- IRCCS Gaslini (GE)
- IRCCS Centro S. G. di Dio (BS)
- IRCCS G.Paolo II (BA)
- IRCCS Mondino (PV)
- IRCCS SDN (NA)
- IRCCS IRST Meldola (FC)
- IRCCS Bellaria (BO)
- IRCCS S. Orsola (BO)
- IMAGO7
- Azienda Osp. Univ. Pisana (PI)
- Azienda Osp. Univ. Careggi (FI)
- Osp. Pediatrico Meyer (FI)
- Ospedale Cardarelli (NA)
- Azienda Sanitaria Cuneo 1 (CN)
- IFO-Ist. Naz. Tumori Regina Elena (RM)
- ASST Niguarda (MI)
- Policlinico di Bari
- Policlinico di Palermo
- Policlinico Univ. di Napoli
- Policlinico San Matteo (PV)

**EU / consortia**

- EADC (EU)
- EDLBC (EU)
- ADNI (US)
- ABIDE (EU/US)
- ENIGMA (WW)

**Scientific associations**

- Italian Association of Medical Physics (AIFM)

# Project timeline

| | | | | | | | | | 2022 | | 2023 | | 2024 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **WP1** | Methodological approaches to handle limited datasets | | **BO** | | | | FI | | | | | | | |
| | | **GE** | | | | PD | PI | PV | | | | | | |
| **WP2** | Explainable techniques for biomedical data | **BA** | BO | | | | | | | | | | | |
| | | | | | | | **PI** | | | | | | | |
| **WP3** | Applications to real data | BA | BO | **CA** | **CT** | FE | FI | | | | | | | |
| | | GE | LNS | MI | NA | PD | PI | **PV** | | | | | | |
| **WP4** | Computing resources and SW repository organization | **BA** | BO | | | | | | | | | | | |
| | | | | | | | **PI** | **PV** | | | | | | |
| **WP5** | Exploitation of research results and communication | BA | BO | CA | CT | FE | **FI** | | | | | | | |
| | | **GE** | LNS | MI | NA | PD | **PI** | PV | | | | | | |

In **bold** sono indicate le sedi degli attuali conveener dei WP

# WP3 tasks

| Sedi partecipanti | | | | | | | | | | | | | Task | Topic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| | | | | FE | | | LNS | | NA | | PI | | **T1** | Radiomics in Digital Breast Tomosynthesis (DBT) |
| | | | | | | | | | | | | | | |
| | BO | | | FE | | | | | NA | | | | **T2** | Super-Resolution in DBT |
| | | | | | | | | | | | | | | |
| | BO | | CT | | | | | | | | | | **T3** | Radiomics in prostate cancer |
| | | | | | | | | | | | | | | |
| | BO | | CT | | | | | | | | | | **T4** | Radiomics and DL in tcMRgFUS |
| | | | | | | | | | | | | | | |
| | BO | | | | | GE | LNS | | | | | | **T5** | Nuclear ~~Neuro~~Imaging Quantification and Radiomics |
| | | | | | | | | | | | | | | |
| BA | | CA | CT | | | | | | | PD | PI | | **T6** | Connectivity in functional MRI and EEG |
| | | | | | | | | | | | | | | |
| | | CA | CT | FE | FI | GE | | MI | | | PI | PV | **T7** | Radiomics and Deep Learning analysis of CT and patients' data in COVID-19 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | PI | PV | **T8** | Radiomics and ML-segmentation on Facio-Scapulo-Humeral dystrophy (FSHD) and lung tumor |
| | | | | | | | | | | | | | | |
| BA | | | | | | | | | | | | PV | **T9** | ML on Imaging data of 10B uptake tracks and dose monitoring by Compton cameras |
| | | | | | | | | | | | | | | |
| | | | | | FI | | | | | | PI | | **T10** | Artificial intelligence for monitoring RT response in soft-tissue sarcomas |
| | | | | | | | | | | | | | | |
| | | | | FE | | | | | | PD | | | **T11** | Machine Learning techniques for cardiological applications |
| | | | | | | | | | | | | | | |
| | | | | | FI | | | | | PD | PI | | **T12** | Application of NLP techniques to clinical notes towards the automated reading of instrumental data |

# Milestones

| | | |
|---|---|---|
| **2022** | | |
| 31 Dec | M1.1 | Identification of methodological pitfalls in case of small datasets |
| 31 Dec | M2.1 | Identification of explainability requirements for medical applications |
| 31 Dec | M3.1 | Identification of data samples for practical use cases and fist tests |
| 30 Jun | M4.1a | Identification of available resources and usage instructions |
| 31 Dec | M4.1b | SW package release instructions |
| 31 Dec | M5.1 | Workshop organization: "~~AI methods and applications in Medical Physics~~" |
| **2023** | | |
| 31 Dec | M1.2 | Definition of robust pipelines for efficient model training on small datasets |
| 31 Dec | M2.2 | Customization of explainability pipelines to AI models for medical imaging |
| 31 Dec | M3.2 | Implementation of robust pipelines and explainability algorithms in at least three different use cases |
| 31 Dec | M4.2 | Integration of at least 1 application per site in **next**AIM SW package repository |
| 31 Dec | M5.2 | Workshop organization: "~~The right to explanation~~" |
| **2024** | | |
| 30 Jun | M2.3 | Definition of optimal explainability methodology for medical problems |
| 31 Dec | M3.3 | Result evaluation for the practical use case and reporting |
| 31 Dec | M4.3 | Integration of all analysis pipelines trained for the use cases of WP3 in the **next**AIM SW package repository |
| 31 Dec | M5.3a | Submission of at least 1 scientific publication per use case |

**WS AI@INFN, Bologna 2-3 Maggio 2022**
**https://agenda.infn.it/event/29907/**

**Workshop "AI methods and applications in Medical Physics"**

31 Dec | M5.3b | **Workshop "The right to explaination"**

# Project status monitoring and reporting

## Project meetings:

- Kick-off meeting 2022 e general meeting 2023 su https://agenda.infn.it/category/1377/
- Meeting mensili (su zoom) tra responsabili locali e conveners dei WP
  - Minute su drive
- Meeting organizzati in autonomia all'interno dei gruppi di lavoro (WP e Task) su piattaforme diverse
  - Se lo riteniamo utile possiamo riattivare il Gruppo Teams che avevamo creato in precedenza

## Project status reporting:

- Consuntivi 2022: da completare per inizio aprile
- Aggiornamento referee: luglio e settembre 2022, report da preparare in vista dei consuntivi
- Aggiornare il sito web https://www.pi.infn.it/aim/
  - e.g. sezioni "Highlights" e "Publications"

# People and budget 2023

| SEZIONE | RICERCATORI | | TECNOLOGI | |
|---|---|---|---|---|
| BA (13 PERSONE - 3.25 FTE) | 2.8 fte | 11 pers. | 0.45 fte | 2 pers. |
| | 3.25 fte / 13 pers. (media 0.25) | | | |
| BO (9 PERSONE - 3.65 FTE) | 3.5 fte | 7 pers. | 0.15 fte | 2 pers. |
| | 3.65 fte / 9 pers. (media 0.41) | | | |
| CA (6 PERSONE - 2.5 FTE) | 2.4 fte | 5 pers. | 0.1 fte | 1 pers. |
| | 2.50 fte / 6 pers. (media 0.42) | | | |
| CT (4 PERSONE - 2.15 FTE) | 2.15 fte | 4 pers. | 0 fte | pers. |
| | 2.15 fte / 4 pers. (media 0.54) | | | |
| FE (6 PERSONE - 1.7 FTE) | 1.7 fte | 6 pers. | 0 fte | pers. |
| | 1.70 fte / 6 pers. (media 0.28) | | | |
| FI (5 PERSONE - 2.1 FTE) | 2.1 fte | 5 pers. | 0 fte | pers. |
| | 2.10 fte / 5 pers. (media 0.42) | | | |
| GE (4 PERSONE - 2.35 FTE) | 2.15 fte | 3 pers. | 0.2 fte | 1 pers. |
| | 2.35 fte / 4 pers. (media 0.59) | | | |
| LNS (4 PERSONE - 2.1 FTE) | 2.1 fte | 4 pers. | 0 fte | pers. |
| | 2.10 fte / 4 pers. (media 0.53) | | | |
| MI (8 PERSONE - 1.2 FTE) | 1.2 fte | 8 pers. | 0 fte | pers. |
| | 1.20 fte / 8 pers. (media 0.15) | | | |
| NA (5 PERSONE - 1.9 FTE) | 1.9 fte | 5 pers. | 0 fte | pers. |
| | 1.90 fte / 5 pers. (media 0.38) | | | |
| PD (4 PERSONE - 1.75 FTE) | 1.75 fte | 4 pers. | 0 fte | pers. |
| | 1.75 fte / 4 pers. (media 0.44) | | | |
| PI (11 PERSONE - 4 FTE) | 3.75 fte | 8 pers. | 0.25 fte | 3 pers. |
| | 4.00 fte / 11 pers. (media 0.36) | | | |
| PV (13 PERSONE - 2.9 FTE) | 2.3 fte | 10 pers. | 0.6 fte | 3 pers. |
| | 2.90 fte / 13 pers. (media 0.22) | | | |
| TOTALE (92 PERSONE - 31.55 FTE) | 29.8 FTE | 80 PERS. | 1.75 FTE | 12 PERS. |

92 persone, 31.55 FTE nel 2023

[82 persone, 27.95 FTE nel 2022]

| Sez. & Suf. | MISS | | | | CON | | | | ALTRICONS | | | | SEM | | | | TRA | | | | PUB | | | | MAN | | | | INV | | | | LIC-SW | | | | APP | | | | SPSERVIZI | | | | TOTALE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. | | Sj | Dot. | Ant. |
| BA | 3.5 | | | | 1.0 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 4.5 | 1.5 | | |
| | 3.0 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 4.0 | | | |
| BO | 2.0 | | | | 3.0 | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | 5 | 3 | | |
| | 1.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | | | |
| CA | 5.0 | | | | 2.0 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 7 | 1.5 | | |
| | 4.0 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 5.0 | | | |
| CT | 3.0 | | | | 2.0 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 5 | 1.5 | | |
| | 2.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 3.5 | | | |
| FE | 2.0 | | | | 1.5 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 3.5 | 1.5 | | |
| | 1.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | | | |
| FI | 3.0 | | | | 2.0 | | | | | | | | | 5 | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | 5 | 7 | | |
| | 2.0 | | | | 1.0 | | | | | | | | | 5.0 | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 3.0 | 5.0 | | |
| GE | 6.5 | | | | 1.5 | | | | | | | | | | | | | | | | 2.5 | | | | 3.0 | | | | | | | | 2.0 | | | | | | | | | | | | 13 | 2.5 | | |
| | 5.0 | | | | 0.0 | | | | | | | | | | | | | | | | 0.0 | | | | 2.0 | | | | | | | | 2.0 | | | | | | | | | | | | 9.0 | | | |
| LNS | 2.0 | | | | 1.0 | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | 3 | 2 | | |
| | 1.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | | | |
| MI | 2.0 | | | | 2.0 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 4 | 1.5 | | |
| | 1.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | | | |
| NA | 2.0 | | | | 1.0 | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | | |
| | 1.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | | | |
| PD | 3.0 | | | | 1.5 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 4.5 | 1.5 | | |
| | 2.0 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 3.0 | | | |
| PI | 6.0 | | | | 2.0 | | | | | | | | | | | | | | | | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | 8 | 1.5 | | |
| | 5.0 | | | | 1.0 | | | | | | | | | | | | | | | | 10.0 | | | | | | | | | | | | | | | | | | | | | | | | 6.0 | 10.0 | | |
| PV | 3.0 | | | | 1.5 | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | 4.5 | 2 | | |
| | 2.5 | | | | 1.0 | | | | | | | | | | | | | | | | 0.0 | | | | | | | | | | | | | | | | | | | | | | | | 3.5 | | | |
| TOTALE | 43 | | | | 22 | | | | | | | | 0 | 5 | | | | | | | 0 | 25 | | | 3 | | | | | | | | 2 | | | | | | | | | | | | 70 | 30 | | |
| | | | | 43 | | | | 22 | | | | 0 | | | | 5 | | | | 0 | | | | 25 | | | | 3 | | | | 0 | | | | 2 | | | | 0 | | | | 0 | | | | 100 |
| | 33.5 | | 0 | 0 | 12 | | 0 | 0 | | | | | 0 | 5 | 0 | 0 | | | | | 0 | 10 | 0 | 0 | 2 | | 0 | 0 | | | | | 2 | | 0 | 0 | | | | | | | | | 49.5 | 15.0 | 0.0 | 0.0 |
| | | | | 33.5 | | | | 12.0 | | | | 0.0 | | | | 5.0 | | | | 0.0 | | | | 10.0 | | | | 2.0 | | | | 0.0 | | | | 2.0 | | | | 0.0 | | | | 0.0 | | | | 64.5 |

64 kE per il 2023

[46 kE nel 2022]

+ access to INFN computing infrastructure [GPU e storage] @ReCaS

# Agenda: 13/02/2023

https://agenda.infn.it/event/34599/

**14:00** → 14:30 **Project overview** — 30m
Speaker: Alessandra Retico (Istituto Nazionale di Fisica Nucleare)

**14:30** → 16:00 **WP1 - Methodological approaches to handle limited datasets**
Conveners: Andrea Chincarini (Istituto Nazionale di Fisica Nucleare) , Daniel Remondini (Istituto Nazionale di Fisica Nucleare)

- 14:30 **Synthetic images generation from small datasets** — 20m
  Speaker: Lorenzo Di Meco
- 14:50 **Low-dimensional signatures from high-dimensional data: the DNetPRO algorithm** — 20m
  Speaker: Nico Curti
- 15:10 **How to deal the small data issue in artificial intelligence within medical image classification: a systematic review** ¶ — 20m
  Speaker: Leonardo Ubaldi (Istituto Nazionale di Fisica Nucleare)
- 15:30 **A bootstrap method to model small datasets with survival outcome** — 20m
  Speaker: Elena Ballante

**16:00** → 16:30 **Coffee break** — 30m

**16:30** → 18:00 **WP2 - Explainable techniques for biomedical data**
Conveners: Alessandra Retico (Istituto Nazionale di Fisica Nucleare) , Sabina Tangaro (Istituto Nazionale di Fisica Nucleare)

- 16:30 **Established XAI techniques** — 30m
  Speaker: Alessandro Fania
- 17:00 **A holistic and analytical approach to assess Trustworthy AI: Z-inspection® project** — 30m
  Speaker: Francesca Lizzi (Istituto Nazionale di Fisica Nucleare)
- 17:30 **Effectiveness of biological inspired neural network models in learning and patterns memorization** — 30m
  Speaker: Nico Curti

**18:00** → 20:00 **Aperitivo** — 2h

# Agenda: 14/02/2023

**08:50 → 10:30** WP3 - Applications to real data
Convener: Piernicola Oliva (University of Sassari and INFN Cagliari)

- 08:50 **A python framework for classification of DBT slices through Deep Learning (WP3.T1)** ¶
  Speaker: Gianfranco Paternò (Istituto Nazionale di Fisica Nucleare)
- 09:15 **An explainable unified approach for mass detection and classification in DBT (WP3.T1)**
  Speaker: Andrea Berti
- 09:40 **Use of GradCAM map for mass localization in DBT (WP3.T1)**
  Speaker: Roberta Ricciardi (Università degli studi di Napoli "Federico II")
- 10:05 **Super-resolution for DBT imaging (WP3.T2)**
  Speaker: Nico Curti

**10:30 → 11:00** Coffee break

**11:00 → 12:40** WP3 - Applications to real data
Convener: Alessandro Lascialfari (Istituto Nazionale di Fisica Nucleare)

- 11:00 **Radiomics in prostate cancer (WP3.T3)**
  Speaker: Maurizio Marrale (University of Palermo)
- 11:25 **Deep learning models for targeting of tc-MRgFUS for essential tremor (WP3.T4)**
  Speaker: M Romero
- 11:50 **Multi-algorithm approach for real-life clinical applications (WP3.T5)**
  Speaker: Francesco Sensi
- 12:15 **Nuclear Medicine Neuroimaging Quantification (WP3.T5)**
  Speaker: Enrico Peira (Istituto Nazionale di Fisica Nucleare)

**12:40 → 14:00** Lunch

**14:00 → 16:05** WP3 - Applications to real data
Convener: Maurizio Marrale (University of Palermo)

- 14:00 **High pathological grade prediction in prostate cancer patients undergoing 18F-PSMA PET/CT using matRadiomics (WP3.T5)**
  Speaker: Giovanni Pasini
- 14:25 **Correct approach to multicentric data harmonization (WP3.T6)**
  Speaker: Piernicola Oliva (University of Sassari and INFN Cagliari)
- 14:50 **Brain Connectivity with rs-EEG (WP3.T6)**
  Speaker: F Cuna
- 15:15 **ML applications for MRI, ECG, and Plethysmography (WP3.T6 + WP3.T11 + WP3.T12)**
  Speaker: Alberto Zucchetta (Istituto Nazionale di Fisica Nucleare)
- 15:40 **Track detection on CR39 for 10B cell uptake measurements (WP3.T9)**
  Speaker: Ian Postuma (Istituto Nazionale di Fisica Nucleare)

**16:05 → 16:30** coffee break

**16:30 → 18:35** WP3 - Applications to real data
Convener: Maurizio Marrale (University of Palermo)

- 16:30 **COVID-19 severity prediction based on radiomics features obtained by exploiting the LungQuant segmentation output (WP3.T7)**
  Speaker: Camilla Scapicchio (Istituto Nazionale di Fisica Nucleare)
- 16:55 **Radiomics and ML for biomarker prediction in Facioscapulohumeral dystrophy (WP3.T8)**
  Speaker: Leonardo Barzaghi
- 17:20 **Radiomics and ML-segmentation on lung tumor, the Blue Sky project (WP3.T8)**
  Speakers: Francesca Brero (Istituto Nazionale di Fisica Nucleare) , Ian Postuma (Istituto Nazionale di Fisica Nucleare) , Raffaella Cabini (Istituto Nazionale di Fisica Nucleare)
- 17:45 **A software for extracting quantitative metrics and radiomic features in CT images of the lung: development of a practical tool and clinical applications (WP3.T8)**
  Speaker: Luca Berta
- 18:10 **Soft tissue sarcoma: transfer learning and fine-tuning for prediction of distant metastasis based on multimodal imaging (WP3.T10)**
  Speaker: Stefano Piffer (Istituto Nazionale di Fisica Nucleare)

**20:00 → 22:00** Social Dinner

Osteria il Gran Burrone, https://www.osteriailgranburrone.it/

# Agenda: 15/02/2023

https://agenda.infn.it/event/34599/

**08:50 → 10:30 WP5 - Exploitation of research results and communication**
Conveners: Andrea Chincarini (Istituto Nazionale di Fisica Nucleare), Cinzia Talamonti (Istituto Nazionale di Fisica Nucleare), Maria Evelina Fantacci (Istituto Nazionale di Fisica Nucleare)

- 08:50 **The DOlab_research environment** — Speaker: Paolo Bosco (INFN - Pisa)
- 09:10 **Working with clinicians: the DORIAN Tech. experience** — Speaker: R Gianeri
- 09:30 **R4I Deeplook** — Speaker: Giovanni Mettivier (Istituto Nazionale di Fisica Nucleare)
- 09:50 **Collaboration with AIFM** — Speakers: Cinzia Talamonti (Istituto Nazionale di Fisica Nucleare), Maria Evelina Fantacci (Istituto Nazionale di Fisica Nucleare) — 20m
- 10:10 **Regolamentare l'IA: tra etica e normativa** — Speaker: G Gozzi — 20m

**10:30 → 11:00 coffee break** — 30m

**11:00 → 12:45 WP4 - Computing resources and SW repository organization**
Conveners: Francesca Lizzi (Istituto Nazionale di Fisica Nucleare), Ian Postuma (Istituto Nazionale di Fisica Nucleare)

- 11:00 **Update on WP4 status: available resources and SW repository** — Speaker: Francesca Lizzi (Istituto Nazionale di Fisica Nucleare) — 30m
- 11:30 **AI-MIGHT and computing resources** — Speaker: Setareh Fatemi (Istituto Nazionale di Fisica Nucleare) — 20m
- 11:50 **Software management @INFN: from git repository to licensing** — Speaker: Francesco Giacomini (Istituto Nazionale di Fisica Nucleare) — 30m
- 12:20 **Discussion** — 25m

**12:45 → 14:00 Lunch** — 1h 15m

**14:00 → 15:30 WP4 - Computing resources and SW repository organization**
Conveners: Francesca Lizzi (Istituto Nazionale di Fisica Nucleare), Ian Postuma (Istituto Nazionale di Fisica Nucleare)

- 14:00 **Hands-on: tutorial on next_AIM repository** — Speakers: Francesca Lizzi (Istituto Nazionale di Fisica Nucleare), Ian Postuma (Istituto Nazionale di Fisica Nucleare) — 1h 30m

**15:30 → 16:00 Discussion and Closing Remarks** — Speaker: Alessandra Retico (Istituto Nazionale di Fisica Nucleare) — 30m

Buon lavoro!