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## CURRICULUM VITAE

Eugenio Paoloni

### Profilo professionale

Professore Associato presso il Dipartimento di Fisica dell'Università di Pisa.  
Responsabile del corso di Laboratorio di Interazioni Fondamentali del corso di laurea magistrale in Interazioni Fondamentali dell'Università di Pisa.  
Incarico di ricerca presso la sezione INFN di Pisa.  
Responsabile del gruppo di ricerca e sviluppo della foto-elettronica dell'esperimento Darkside.

### Esperienze lavorative recenti

Ricercatore in formazione presso l'Università di Pisa 2006 - 2009  
Ricercatore presso l'Università di Pisa 2009 - 2017  
Responsabile locale del progetto speciale INFN NTA-SuperB 2006-2014  
Responsabile della costruzione del doppietto di focheggiamento finale dell'esperimento SuperB 2006-2014  
Coordinatore del gruppo Machine-Detector Interface dell'esperimento SuperB 2009-2014  
Responsabile dello sviluppo del codice di ricostruzione delle tracce cariche dell'esperimento Belle-2 2015-2020  
Responsabile locale dell'esperimento INFN di gruppo 2 Darkside 2016-  
Responsabile dello sviluppo della foto-elettronica di Darkside 2020-

### Istruzione

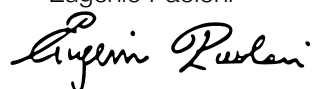
Maturità scientifica.  
Laurea in Fisica presso l'Università di Pisa.  
Dottorato di Ricerca in Fisica presso l'Università di Pisa.

### Lingue

Italiano lingua madre.  
Inglese parlato e scritto.  
Francese parlato e scritto

Pisa, 3 marzo 2021

Eugenio Paoloni



## **CURRICULUM VITAE di Roberta Frassi**

**Roberta Frassi, ha conseguito il diploma di maturita' linguistica nell'anno scolastico 1989/90 c/o l'Istituto Tecnico Statale "C. Gambacorti" di Pisa con la votazione di 57/60.**

**Dal febbraio al maggio 1991 ha prestato servizio presso la sez. di Pisa dell'INFN con contratto ex art.6 come Assistente di Amministrazione VI liv. con mansioni di supporto dell'ufficio acquisti e contabilita' e dell' ufficio protocollo.**

**Nel dicembre 1991 e' risultata vincitrice della selezione n. 1806/91 per due unita' di personale con contratto ex art.7 legge 554/88 con profilo di collaboratore di amm.ne VII livello.**

**Nel gennaio 1992 e' risultata vincitrice anche del concorso INFN n. 1778/91 approvato con delibera dalla Giunta Esecutiva dell'INFN n. 2541 del 6.2.92 per n. 1 posto di ruolo con profilo di Collaboratore di Amministrazione VII livello; pur avendo vinto tale concorso ha preso servizio con contratto art. 7 legge 554/88 a causa del blocco delle assunzioni .**

**La candidata ha iniziato la sua attivita' nell'ufficio acquisti occupandosi della digitalizzazione degli ordinativi Italia ed estero, della registrazione delle fatture e del riscontro delle stesse.**

**Dal 1 novembre 1993 ha preso servizio di ruolo c/o la Sezione di Pisa dell'INFN.**

**Dal dicembre 1996, in seguito alla ristrutturazione dei servizi amministrativi della Sezione, in relazione al nuovo progetto "Virgo", al quale erano stati assegnati alcuni dipendenti, la sottoscritta ha svolto le seguenti attivita' d:**

- **verifica della documentazione commerciale delle proposte di ordinativi;**
- **gestione degli ordinativi per tutti gli acquisti in Italia e all'estero della Sez. di Pisa dell'INFN.;**
- **corrispondenza commerciale con fornitori per acquisti e pagamenti;**
- **corrispondenza commerciale con i laboratori di ricerca stranieri (Fermi National Accelerator, CERN, e SLAC) per acquisti nell'ambito delle collaborazioni straniere cui afferiscono i gruppi di ricerca della Sezione;**
- **assistenza e consulenza ai responsabili dei gruppi di ricerca della Sez. di Pisa per tutte le procedure inerenti gli acquisti in Italia e all'estero;**
- **istruttoria ed elaborazione delle pratiche relative alle procedure di gara, suggerendo a quale tipo di procedura ricorrere, in ottemperanza alla normativa vigente;**
- **istruttoria di atti per richieste di forniture e servizi da sottoporre ad approvazione degli Organi Deliberanti dell'ENTE e controllo del loro iter sino all'approvazione;**
- **verifica regolarita' forniture o prestazioni di servizi (confronto ordine-ddt-fattura-accertamento collaudo-verifica copertura impegno con eventuale allineamento);**

- archivio generale ordini, contratti, corrispondenza commerciale della sezione;
- tenuta del registro IVA riguardante le fatture "intracomunitarie".

Nel settembre del 2003 si è iscritta al Corso di Laurea di Scienze Politiche – Amministrazioni Pubbliche ed Economia di Mercato.

Nel marzo 2008 ha conseguito la laurea triennale I livello del Corso di Laurea Amministrazioni Pubbliche ed Economie di Mercato della Facoltà di Scienze Politiche dell'Università di Pisa discutendo la tesi su " Il dialogo competitivo: una procedura di aggiudicazione degli appalti pubblici".

Dal 1 Giugno 2015 ricopre la carica di Responsabile del Servizio di Amministrazione della Sezione INFN di Pisa coordinando le seguenti attività:

- ragioneria;
- gestione del bilancio e della spesa;
- contratti;
- fondo economale;
- patrimonio;
- liquidazione missioni ed indennità;
- magazzino.

Pisa, 19/01/2021

Roberta Giommi

# Curriculum formativo, scientifico e didattico

## Luca Galli

Mi sono laureato all'università di Pisa in fisica delle interazioni fondamentali nell'Ottobre 2006 con una tesi sul sistema elettronico di trigger dell'esperimento MEG sotto la supervisione del dott. Marco Grassi. Nel 2010 ho conseguito il dottorato di ricerca con una tesi sempre sull'esperimento MEG.

Dopo un'esperienza all'estero presso il Paul Scherrer Institut ho vinto un concorso per una posizione a tempo determinato prima e dal 2016 a tempo indeterminato presso l'INFN Sezione di Pisa. Dal 2014 sono responsabile per il disegno e la costruzione per il sistema elettronico di trigger per l'esperimento MEG II.

Dal 2019 sono anche il responsabile locale del gruppo MEG della sezione di Pisa.

Di seguito sono riportati i dettagli della mia carriera accademica, le responsabilità e i progetti coordinati.

### Posizione attuale, Titoli scolastici e accademici

- 2/2017 - ora** Ricercatore di terzo livello a tempo indeterminato presso l'Istituto Nazionale di Fisica Nucleare sezione di Pisa
- 4/2016 - 10/2016** *Gastwissenschaftler* ("guest scientist") presso il Paul Scherrer Institut (Villigen, Svizzera) per collaborare all'esperimento MEG II
- 2/2016 - 1/2017** Ricercatore di terzo livello con contratto a tempo determinato di durata annuale (Art. 36) presso l'Istituto Nazionale di Fisica Nucleare sezione di Pisa, posizione finanziata su fondi interni INFN
- 2/2014 - 01/2016** Ricercatore di terzo livello con contratto a tempo determinato di durata biennale (Art. 23) presso l'Istituto Nazionale di Fisica Nucleare sezione di Pisa, posizione finanziata su fondi interni INFN
- 2/2013 - 1/2014** Contratto di fellowship (durata 1+1 anni) presso il Paul Scherrer Institut
- 1/2011 - 12/2012** Vincitore di assegno di ricerca biennale finanziato dall'INFN presso la sezione di Pisa dal titolo "Rivelatori per radiazione ionizzante"
- 7-12/2010** Borsa di studio semestrale presso il dipartimento di Fisica dell'Università di Pisa dal titolo "Controllo e misura delle efficienze del sistema di trigger dell'esperimento MEG"

- 2008 - 2009** Ospite presso il Paul Scherrer Institut con posizione “Half-PhD position”
- 2008** Assegnatario di una Borsa di Studio della Fondazione “Angelo della Riccia” di durata annuale per lo svolgimento di attività di ricerca presso il Paul Scherrer Institut (Svizzera)
- 2007 - 2009** Studente con borsa nel XXII ciclo del corso di dottorato in Fisica Generale presso l’Università di Pisa con tesi dal titolo “A real-time glance at the Lepton Flavour Violating decay  $\mu \rightarrow e\gamma$  in the MEG experiment”, (relatore Dott. M. Grassi)
- 2004 - 2006** Laurea specialistica in Fisica Generale presso l’Università degli studi di Pisa.  
Tesi di Laurea dal titolo: “Il sistema di trigger dell’esperimento MEG per la ricerca del decadimento  $\mu \rightarrow e\gamma$ ” (110/110 *cum laude*, relatori Dott. M. Grassi e Prof. D. Nicolò)
- 2001 - 2004** Laurea triennale in Fisica Generale presso l’Università degli studi di Pisa.  
Tesi di Laurea dal titolo: “Il modello a quark e il sistema a pentaquark” (110/110 *cum laude*, relatore Dott. M. Viviani)

## Esperienze di Coordinazione e Responsabilità

- 2019-ora** Coordinatore INFN del gruppo MEG per la di sezione di Pisa.
- 2018-ora** Responsabile del Trigger per l’esperimento FOOT.
- 2016** *Run coordinator* per il pre-engineering nell’estate 2016 per l’esperimento MEG II
- 2014-ora** Responsabile del disegno, produzione e sviluppo dell’elettronica di trigger ed acquisizione dati dell’esperimento MEG II
- 2011-2014** Responsabile del disegno, sviluppo e messa in funzione e manutenzione di un tracciatore al silicio per raggi cosmici come stazione di test per prototipi della camera a deriva dell’esperimento MEG II
- 2010-2016** Responsabile dell’allineamento software delle camere a deriva dell’esperimento MEG
- 2010-2016** Co-responsabile della misura della normalizzazione dell’esperimento MEG con il conteggio dei positroni di Michel
- 2010-2013** *Shift coordinator* per il run dell’esperimento MEG

**2009-2013** Responsabile della calibrazione, funzionamento e misura dell'efficienza del sistema di trigger dell'esperimento MEG

**2009-2013** Figura di *expert on call* per i sistemi di trigger ed acquisizione dati dell'esperimento MEG

## **Coordinatore progetti**

**2020** Promotore e coordinatore del progetto "Commissioning of the MEG II drift chamber" approvato dalla commissione scientifica 1 come borsa trimestrale per laureandi o neo laureati. Borsa assegnata ad Andrea Gurgone che ha trascorso al PSI 3 mesi da Agosto a Ottobre 2020.

**2019** Promotore e coordinatore del progetto "Commissioning of the MEG II drift chamber" approvato dalla commissione scientifica 1 come borsa trimestrale per laureandi o neo laureati. Borsa assegnata ad Anastasio Fratangelo che ha trascorso al PSI 3 mesi da Maggio a Luglio 2019.

**2017** Promotore e coordinatore del progetto "Commissioning of the MEG II TDAQ system" approvato dalla commissione scientifica 1 come borsa trimestrale per laureandi o neo laureati. Borsa assegnata a Manuel Meucci che ha trascorso al PSI 3 mesi dal 15 Novembre 2017 al 15 Febbraio 2018.

**2017** Responsabile del progetto "CHELN, cherenkov light in noble gases"

**FORMATO EUROPEO  
PER IL CURRICULUM  
VITAE**



**INFORMAZIONI PERSONALI**

Nome

**FEDERICO PILO**

E-mail

federico.pilo@pi.infn.it

**ESPERIENZA LAVORATIVA**

- Date (da – a)
- Nome e indirizzo del datore di lavoro

**2018-PRESENTE**

ISTITUTO NAZIONALE DI FISICA NUCLEARE  
Piazza dei Caprettari, 70 - 00186 Roma (RM) - Italia  
ENTE PUBBLICO DI RICERCA  
RICERCATORE

Coordinatore nazionale del progetto INFN-SWEATERS volto allo sviluppo di rivelatori a gas per atomi neutri di bassa energia. Sviluppo hardware ed attività sperimentale nell'ambito della collaborazione Virgo.

- Date (da – a)
- Nome e indirizzo del datore di lavoro

**2018**

BLUE TEAM COMPUTERS S.r.l.u.  
Via delle Cateratte, 92 . 571222 Livorno (LI) - Italia  
SVILUPPO SOFTWARE PER AMBIENTE MARITTIMO E PORTUALE  
PROGETTISCA E SVILUPPATORE SOFTWARE

Ricerca e sviluppo. Responsabile sviluppo e progettazione applicazioni "mobile". Progettazione e realizzazione di sistemi informativi. Coordinatore aziendale nell'ambito del progetto INFN-Sensorsek.

- Date (da – a)
- Nome e indirizzo del datore di lavoro

**2016-2018**

ISTITUTO NAZIONALE DI FISICA NUCLEARE  
Piazza dei Caprettari, 70 - 00186 Roma (RM) - Italia  
ENTE PUBBLICO DI RICERCA  
RICERCATORE

Collaborazione scientifica nell'ambito dell'esperimento EEE. Il progetto, ideato e condotto dal professor Antonino Zichichi, è realizzato dal Centro Fermi in collaborazione con INFN e MIUR ed è costituito da un network di rivelatori di raggi cosmici esteso su tutto il territorio italiano; la mia attività ha riguardato la costruzione e installazione di nuove stazioni di rivelazione, la organizzazione e coordinazione della presa dati congiunta di tutte le stazioni, la manutenzione e upgrade dei telescopi già installati. Referente del progetto per la Toscana e coordinatore del gruppo di ricerca della sezione INFN di Pisa coinvolto nel progetto.

- Date (da – a)
- Nome e indirizzo del datore di lavoro

**2008-2016**

ISTITUTO NAZIONALE DI FISICA NUCLEARE  
Piazza dei Caprettari, 70 - 00186 Roma (RM) - Italia  
ENTE PUBBLICO DI RICERCA  
RICERCATORE

- Tipo di azienda o settore
- Tipo di impiego

- Principali mansioni e responsabilità
 

Attività di ricerca nell'ambito della collaborazione internazionale AMS-02, guidata dal premio Nobel professor Samuel C.C. Ting, con particolare riguardo ad attività di integrazione, commissioning ed analisi dati dell'esperimento stesso. Il rivelatore AMS-02 è stato installato nella primavera 2011 sulla Stazione Spaziale Internazionale (ISS), dove è attualmente in presa dati. L'intensa attività di collaudo e le prime fasi operative hanno richiesto lunghe permanenze presso i centri NASA di Cape Canaveral e Houston (Stati Uniti), nonché presso il centro ESA di ESTEC (Paesi Bassi). Durante tutto il periodo, lavorando nel team responsabile per l'acquisizione dati dell'esperimento, sono stato impegnato negli ultimi test di collaudo e nello sviluppo e validazione del software di controllo e supervisione dell'apparato per il periodo di operatività nello spazio. Nel maggio 2011, alcune ore dopo il lancio, ho avuto il privilegio di eseguire le procedure per la prima accensione del rivelatore nello spazio, operazione effettuata con successo.
- 
- Date (da – a)
  - Nome e indirizzo del datore di lavoro
 

**2003-2008**  
 UNIVERSITA' DEGLI STUDI DI PISA  
 Lungarno Pacinotti, 43 - 56126 Pisa (PI) - Italia
  - Tipo di azienda o settore
 

UNIVERSITA' PUBBLICA
  - Tipo di impiego
 

RICERCATORE
  - Principali mansioni e responsabilità
 

Attività di ricerca sul tema "Studio della radiazione gamma con l'esperimento AMS-02"; con il ruolo di responsabile della costruzione del modello di volo del calorimetro elettromagnetico.

## ISTRUZIONE E FORMAZIONE

- Date (da – a)
  - Nome e tipo di istituto di istruzione o formazione
 

2000-2003  
 Facoltà di Scienze Matematiche, Fisiche Naturali – Corso di Dottorato in Fisica Sperimentale (XVI ciclo) presso l'Università degli Studi di Siena
  - Qualifica conseguita
 

**Dottorato di ricerca in Fisica Sperimentale**  
 Tesi di dottorato svolta presso l'Istituto Nazionale di Fisica Nucleare (INFN) di Pisa. Titolo della tesi : "Diffuse Gamma Ray emission detection with the AMS-02 electromagnetic calorimeter".
- 
- Date (da – a)
  - Nome e tipo di istituto di istruzione o formazione
 

1995-2000  
 Facoltà di Scienze Matematiche, Fisiche Naturali – Corso di Laurea in Fisica presso l'Università degli Studi di Pisa
  - Qualifica conseguita
 

**Laurea in Fisica**  
 Tesi svolta presso l'Istituto Nazionale di Fisica Nucleare (INFN) di Pisa e il CERN di Ginevra. Titolo della tesi : "Un calorimetro elettromagnetico per l'esperimento AMS-02".
  - Livello nella classificazione nazionale (se pertinente)
 

110/110
- 
- Date (da – a)
  - Nome e tipo di istituto di istruzione o formazione
 

1990-1995  
 Liceo Scientifico Statale F. Enriquez, Livorno
  - Qualifica conseguita
 

**Maturità scientifica**
  - Livello nella classificazione nazionale (se pertinente)
 

60/60



## CAPACITÀ E COMPETENZE

### PERSONALI

*Acquisite nel corso della vita e della carriera ma non necessariamente riconosciute da certificati e diplomi ufficiali.*

#### MADRELINGUA

ITALIANO

#### ALTRE LINGUA

#### INGLESE

- Capacità di lettura
- Capacità di scrittura
- Capacità di espressione orale

ECCELLENTE

MOLTO BUONA

BUONA

## CAPACITÀ E COMPETENZE

### RELAZIONALI

*Vivere e lavorare con altre persone, in ambiente multiculturale, occupando posti in cui la comunicazione è importante e in situazioni in cui è essenziale lavorare in squadra (ad es. cultura e sport), ecc.*

Ho spiccata attitudine al lavoro in team. Sono naturalmente portato alla mediazione e alla collaborazione proficua, anche con figure professionali complementari alla mia. Le mie esperienze lavorative hanno comportato frequenti soggiorni all'estero e la continua interazione con colleghi stranieri, permettendomi di consolidare le mie capacità di relazione e collaborazione – anche in ambito internazionale. Connaturate alla mia figura professionale sono anche l'elevata autonomia e versatilità, e l'abitudine al processo logico-creativo del problem-solving. Ho facilità a inserirmi in nuovi contesti lavorativi, trovo stimolante confrontarmi con sfide inedite, anche e soprattutto quando ciò richiede di acquisire nuove competenze. In particolare, ho interesse e facilità nell'apprendere l'uso di nuovi software applicativi e linguaggi di programmazione.

## CAPACITÀ E COMPETENZE

### ORGANIZZATIVE

*Ad es. coordinamento e amministrazione di persone, progetti, bilanci; sul posto di lavoro, in attività di volontariato (ad es. cultura e sport), a casa, ecc.*

Sono abituato a seguire un progetto in tutte le sue fasi, da quella di analisi, sviluppo e progettazione, alla ricerca dei finanziamenti, all'individuazione di soggetti adatti alla fornitura di tecnologie e manodopera, fino alla realizzazione e messa in opera. Ho grande disponibilità al massimo impegno nel lavoro per il conseguimento degli obiettivi, ottimo spirito di organizzazione e attitudine al coordinamento di gruppi di lavoro. Da ottobre 2013 sono referente del progetto EEE per la Toscana e coordinatore del gruppo di ricerca della sezione INFN di Pisa. Da gennaio 2004 a maggio 2005, nell'ambito dell'esperimento AMS-02, ho ricoperto il ruolo di responsabile della costruzione del modello di volo del calorimetro elettromagnetico, e della costruzione e qualificazione della meccanica di supporto per l'elettronica del rivelatore.

## CAPACITÀ E COMPETENZE

### TECNICHE

*Con computer, attrezzature specifiche, macchinari, ecc.*

Ottime capacità di gestione del PC sia in ambiente Windows che Linux (esperienze anche con sistemi Unix e Macintosh). Vasta esperienza di programmazione per applicazioni real-time, gestione e analisi dati.

#### Programmazione e Linguaggi

Ottima conoscenza di C++, C. Molteplici esperienze di programmazione in php e sviluppo web Front-End: CAKEPHP framework, Javascript, JQuery. Esperienza di utilizzo di CMS: Drupal. Sviluppo applicazioni con .NET framework principalmente in Visual Basic, con esperienza in VisualC++ e Visual C#. Database: mySQL, Microsoft Access.

#### Progettazione e sviluppo

Lunga esperienza di progettazione, costruzione e caratterizzazione di rivelatori di particelle per la fisica delle alte energie (rivelatori allo stato solido, rivelatori a gas, rivelatori a luce di scintillazione) Test funzionali su schede e circuiti integrati con ottima conoscenza di strumentazione di laboratorio. Progettazione di circuiti stampati con ECAD come ALTIUM, ORCAD. Programmazione di microcontrollori.

#### Automazione industriale

Sviluppo sistemi di controllo: programmazione PLC Omron e Telemecanique. Realizzazione di sistemi di supervisione con software HMI/SCADA: Progea Movicon, ARC Informatique PcVue

#### Industria Metalmeccanica/Aeronautica

Programmazione ed utilizzo di centri di lavoro CNC con più di tre anni di esperienza.

Costruzione, assemblaggio e cablaggio di parti meccaniche e elettroniche per applicazioni spaziali. Programmazione e utilizzo di macchine a elettroerosione con più di due anni di esperienza. Esperienza base nella programmazione di torni CNC. Ottima conoscenza di applicativi CAD/CAM: Autocad, CATIA. Buona lettura di disegno meccanico e esperienza base nella progettazione meccanica.

Altro

Utilizzo e sviluppo di simulazioni con metodo Monte Carlo. Utilizzo e sviluppo di programmi software per l'analisi statistica di dati. Sviluppo di sistemi di acquisizione con sistemi VME, elettronica di tipo spaziale e custom.

ALTRE CAPACITÀ E COMPETENZE

*Competenze non precedentemente indicate.*

Ho ottime capacità di illustrazione e presentazione dei risultati, maturate in esperienze pluriennali di meeting di lavoro e conferenze nazionali e internazionali di fisica delle particelle elementari, astrofisica e cosmologia. Ho esperienza di divulgazione scientifica con all'attivo seminari e lezioni su argomenti di fisica delle particelle elementari, astrofisica e cosmologia presso scuole superiori, Istituti di ricerca e manifestazioni di comunicazione scientifica.

Autorizzo il trattamento dei miei dati personali ai sensi del D.lgs. 196 del 30 giugno 2003.

Livorno, 25 febbraio 2021

Federico Pilo



# CURRICULUM FORMATIVO ATTIVITA SVOLTA

**Antonio Orsini**

email [antonio.orsini@pi.infn.it](mailto:antonio.orsini@pi.infn.it)

## ISTRUZIONE

-Ha conseguito il DIPLOMA di Perito Tecnico Industriale in Costruzioni Aeronautiche presso l'Istituto Tecnico Leonardo da Vinci di Pisa il 23 luglio 1977.

## FORMAZIONE

- Corso Famup per programmazione Selca 4045 PD tenuto in sezione (24,25-06-2008)

- Corso Sandvik tenuto in sezione (03,04,05-02-2009)

- Corso Famup per programmazione Selca 4045 PD tenuto in sezione (14,15-12-2010)

- Corso Heidenhain per programmazione Selca 4045 PD tenuto in sezione (15,17-10-2013)

- Corso di Programmazione Fagor 8055 per tornio a controllo tenuto in sezione (23,24-11-2015)

## ESPERIENZA LAVORATIVA NEL V LIVELLO C.T.E.R

- Il suo ruolo nella sezione I.N.F.N di Pisa e' sempre consistito in attivita' tecniche di supporto ai gruppi di ricerca sperimentale, e in particolare nella costruzione di elementi meccanici e al loro montaggio su i vari apparati sperimentali. Ha anche intensamente svolto attivita' di supporto ad apparati sperimentali in vari laboratori di ricerca nazionali (L.N.F, L.N.) ed internazionali (FERMILAB, CERN, P.S.I, I.H.E.P, UNIVERSITA' DEL MARYLAND).

-A partire dal Gennaio 2007 ha collaborato nelle fasi di sviluppo e realizzazione finale degli esperimenti qui di seguito elencati:

**AMS, ANTARES, ATLAS, BABAR, CMS, CREAM, DASIPIM, DOPET-08, FISICA**

**MEDICA, GIRO LASER, ILC, MAGIC, MEG, MU2E, NA62, NBI, PIXIE, SLIM 5**

Pisa, 17-02-2021



# Curriculum Vitae

Angela Papa, Ph.D.

University of Pisa and INFN  
Dipartimento di Fisica "E. Fermi"  
Largo Bruno Pontecorvo  
Edificio C/208  
56127 Pisa  
Italy

Paul Scherrer Institute  
Laboratory for Particle Physics  
Muon Physics Group  
WBWA/131  
5232 Villigen-PSI  
Switzerland

## Education

- January 2005 - Dec. 2007** PhD school in Physics, Pisa University and INFN, Italy  
(*Award for the Best Ph.D. Thesis in Particle Physics [national selection]*);
- April 2003 - March 2004** Specialisation in Particle Physics, Pisa University, Italy  
(110/110 *cum laude*);
- January 1998 - March 2003** Master in Particle Physics, Pisa University, Italy  
(110/110 *cum laude*);
- September 1992 - July 1997** High school, Liceo Scientifico Scalea (CS), Italy  
(60/60);

## Research experience

- Jan 2021 - now** Associate Professor, **University of Pisa and INFN**, Italy [permanent];
- Jan 2018 - Jan 2021** R.L. Montalcini TT ass. Prof., **University of Pisa and INFN**, Italy [tenure track];
- July 2011 - Jan 2018** Research Scientist, **Paul Scherrer Institute**, Switzerland [permanent];
- Apr 2010 - June 2011** Postdoctoral fellow, **Paul Scherrer Institute**, Switzerland;
- Jun 2008 - Mar 2010** Postdoctoral fellow, **University of Pisa and INFN**, Italy;
- Jan 2008 - May 2008** Research associate, **University of Pisa**, Italy;
- Jan 2005 - Dec 2007** Research assistant, **University of Pisa**, Italy;
- July 2004 - Dec 2004** Research assistant, **Pisa INFN**, Italy;

## Teaching Duties

### 1. February 2018 - present

University of Pisa, Italy;

- University of Pisa, Physics Department: Physics Laboratory I [12 CFU];
- University of Pisa, Mechanics Engineering Department: Physics II [6 CFU];
- University of Pisa, Energy Engineering Department: Physics II [6 CFU];
  
- Member of the exam's committee for the above courses, UniPi [2018-now]
- Member of the Bachelor Thesis final exam's committee for the Physics Department, UniPi [2019-now]
- Referee for Master Thesis at the Physics Department, UniPi [2018-now];
- Member of the committee for the admission to the PhD in Fisica degli acceleratori, Università La Sapienza [2020];
- Member of the committee for the admission to the PhD in Physics, ETH Zurich [2020];

### 2. April 2010 - December 2017

PSI, Switzerland;

- Lectures on Particle Physics and Detectors for Summer Students at PSI;

### 3. March 2008 - March 2010

Teaching assistant, University of Pisa, Italy;

- University of Pisa, Mechanics Engineering Department: Physics II - Exercises
- University of Pisa, Physics Department: Special lectures on particle physics - Masterclass;

## Mentoring Duties

### 1. January 2010 - present

- Post-doc mentor
  - M. Francesconi, INFN Pisa [2020-now];
  - M. Chiappini, INFN Pisa [2020-now];
  - G. Chiarello, INFN Rome [2017-now];
  - E. Ripiccini, PSI Villigen & Fondazione della Riccia and INFN [2015-2016];
  - Y. Bao, PSI Villigen [2011-2012];
- Ph.D. Thesis supervision
  - B. Vitali, University of Rome and INFN [2020- now];
  - G. Dal Maso, University of Rome and INFN [2020- now];
  - P. Schwendimann, ETH Zurich [2017- now];
  - G. Rutar, ETH Zurich [2013-2017];
  - E. Ripiccini, University of Rome and INFN [2012-2014];
- Ph.D. Thesis external examiner
  - F. Brizioli, University of Perugia [2020];
  - A. Damyanova, University of Geneva [2019];

- R. Donghia, University of Rome 3 [2018-2019];
- B. Krikler, Imperial College London [2016-2017];
- Master's Thesis supervision
  - G. Dal Maso, University of Pisa [2020];
  - A. Gurgone, University of Pisa [2019-now];
  - M. Ottiger, ETH Zurich [2017-2018];
  - D. Horvath, ETH Zurich [2016-2017];
  - R. Iwai, University of Tokyo [2015-2016];
  - P. Schwendimann, ETH Zurich [2014-2015];
  - F. Tenchini, University of Pisa and INFN [2009-2010];
- Master's Thesis referee
  - R.N. Pilato, University of Pisa [2019];
  - B. Vitali, University of Pisa [2020];

- Bachelor's Thesis supervision
  - P. Sergi, University of Lecce and INFN [2014];
- Advisor of "Summer student" projects [7 weeks] and "Semesterarbeiten" projects [3 weeks] at PSI [2010-present]: 2-3 students/year (more than 20 students up to now);
- Since 2018 responsible and project&student advisor for the PSI summer student project with 2 dedicated grants/year assigned to UniPi allowing UniPi students to spent a minimum of 7 weeks at PSI.

## Honors, Awards and Grants

- 1. RISE (Research and Innovation Staff Exchange) Award and Grant, beneficiary** (H2020-MSCA-RISE 2020, aMUSE project, Proposal number 101006726), Horizon 2020, Europe [2020] (Tot. 1.9 MEuro);
- 2. RISE (Research and Innovation Staff Exchange) Award and Grant, beneficiary** (H2020-MSCA-RISE 2020, PROBES project, Proposal number 101003460), Horizon 2020, Europe [2020] (Tot. 2.08 MEuro);
- 3. ITN Innovative Training Networks (research training and/or doctoral programme) Award and Grant, beneficiary** (H2020-MSCA-ITN 2019. INTENSE project, Proposal number 858199), Horizon 2020, Europe [2020] (Tot. 2.6 MEuro);
- 4. Accelerator Innovation ARIES2 Grant, beneficiary** (Accelerator Research and Innovation for European Science and Society 2020), MUST project, (Tot. 480 kEuro);
- 5. BIHO Award and Grant, PI** (H2020-MSCA-RISE 2019, PROBES project, Proposal number 871364), Italian Ministry of Education University and Research, Italy [2019] (Tot. 50 kEuro);
- 6. Rita Levi Montalcini Award and Grant, PI** (DM n.350), Italian Ministry of Education University and Research, Italy [2018] (Tot. 265 kEuro);
- 7. Swiss National Foundation Grant, PI** (200020\_172706), Swiss National Foundation, Switzerland [2017] (Tot. 243 kCHF);
- 8. Swiss National Foundation Grant** (IZK0Z2\_151047), Swiss National Foundation, Switzerland [2013];
- 9. Marcello Conversi Prize in Particle Physics**, Istituto Nazionale di Fisica Nucleare, Italy [2010];
- 10. INFN abilitazione as Permanent Researcher**, (recognised first on the list) Istituto Nazionale di Fisica Nucleare, Italy [2009];
- 11. Italian Physics Society and European Physics Society Award for young researcher in Particle Physics**, Società Italiana di Fisica, Italy [2008];
- 12. Fondazione della Riccia Special Fellowship**, Italy [2005];
- 13. INFN Award and Special Fellowship for Master Students** (recognised first on the list), Istituto Nazionale Fisica Nucleare, Italy [2004];
- 14. INFN Summer Student in physics**, FERMI LAB, Chicago, USA [July - October 2001];

## Scientific leaderships

- 1. Member of the MEG/MEGII international collaboration**
  - a. Technical and run coordinator for the MEGII experiment** (from January 2018 - now)

## **b. Project leader for**

- The MEGII muon beam line (The most intense continuous muon beam in the world ( $2 \cdot 10^8$  muons/s) which lies PSI at the Particle Physics Intensity Frontiers with a cyclotron facility delivering a proton beam of 590 MeV energy at a current up to 2.4 mA (1.4 MW));
  - It includes also: pion and positron beams optimised for the MEGII detector for calibration purposes and the development of new beam monitoring detectors able to work at the intensities frontiers
- MEG/MEGII calibration and monitoring methods of all MEG/MEGII sub-detectors including dedicated experimental setup at room and cryogenic temperature combined with specific particle beams and the operation of a dedicated 1 MeV Cockcroft-Walton accelerator and its beam line and a Deuteron-Deuteron Neutron Generator
  - Construction/implementation/commissioning/operation during the physics run
  - Monte Carlo simulation, Data acquisition and Analysis
- Exotic physics searches with the MEGII detector (promoter and principal investigator)

## **c. Services and Tasks before the MEG physics run:**

- The new Liquid Xenon calorimetry: Xe optical properties, small and large prototypes, cryogenic facility and PMT characterisation, final LXe calorimeter assembly, Monte Carlo simulation and reconstructed algorithms. LXe Detector commissioning. Timing Counter analysis tasks. LXe-Timing Counter timing
- Design and construction of the first calibration and monitoring methods
- Monte Carlo simulation and Data Analysis

## **d. Services and Tasks during the MEG physics run:**

- Run coordination, shift coordination and shifts
- Expert on call for all the MEGII beam lines (muon, pion and positron), the special calibration devices (C-W accelerator, Neutron generator and radioactive sources) and online data quality and Detector calibrations
- Monte Carlo simulation and Data Analysis

## **2. Member of the Mu3e international collaboration**

### **a. Projects**

- Development and design of the fibre hodoscope detector (co-responsible)
  - Detector design and R&D. Monte Carlo simulation, Data acquisition and Analysis
- Exotic physics searches with the Mu3e detector (co-responsible)



- Beam line (co-responsible)

### **3. Member of the high intensity muon beam project (International HiMB project)**

#### **a. Project leader for**

- Development and design of beam monitoring detectors working at the highest continuous muon beam intensities in the world

### **4. Member of the high brightness ultra-cold muon beam experiment: PSI Experiment R-14-02.1 (muCool International collaboration)**

#### **a. Promotor and project leader for**

- Extension of muCool technique for negative muons and R&D studies for applications to muon colliders

#### **b. Group member for**

- Timing Detectors
- Data acquisition and Analysis

### **5. Member of the MuX experiment, PSI experiment R-16-01.1**

#### **a. Group member for**

- Timing Detectors

### **6. Principal Investigator for the detector R&D for the new LaBr<sub>3</sub>:Ce (BRiLANCe) and LYSO calorimetry with SiPM for future charged Lepton Flavour Violation searches**

- Design, construction and commissioning of a first large detector prototype; Monte Carlo simulation and data analysis

### **7. Member of the FOXFIRE project**

- From the photomultipliers to the silicon photomultipliers able to work at cryogenic temperature and in the vacuum ultra-violet emission light region for a simultaneously charge and scintillation light readout

## **Scientific Services**

### **1. Scientific research committee**

- PSI Foko (Forschung Kommission, i.e. PSI research Committee ) [2017-now];
- Member of the MSCA co-found post-doc fellow selection committee [2018-now];
- Member of the PSI Particle Physics committee for the selection of PhD, post-doc and permanent researchers [2018-now];
- Member of the PSI committee for the PSI medal award (best PhD thesis) [2018-now];

- International reviewer for the National Science Center, Poland [2020-now];

## **2. Conference committee**

- International Conference on Technology and Instrumentation in Particle Physics (TIPP2020, TRIUMF): Precision physics session convener.
- Kick-off workshop for the search of a muon EDM using the frozen spin technique at PSI: International scientific program member and adviser. Working group IV convener and session chair [2020];
- The 10th Anniversary JPARC symposium 2019: session chair [2019];
- European Physical Society Conference on High Energy Physics (HEP-EPS): Flavour physics and CP violation working group convener [2019];
- International workshop on Neutrinos from Accelerators (NUFACT): Scientific Program Committee member [2018-now]
- International Conference on High Energy Physics (ICHEP): Quark and lepton flavour physics working group convener [2018];
- International workshop on Weak Interactions and Neutrinos (WIN): Flavour and precision physics working group convener [2017];
- Neutrino Factories and Future Neutrino Facilities (NuFact): Muon physics working group convener (European representative member) [2014 - 2017];
- Physics of fundamental Symmetries and Interactions (PSI): session chair [2013 and 2016];
- IEEE Nuclear Science Symposium and Medical Imaging Conference NSS/MIC: session chair [2016 and 2017];

## **3. Journal reviewer**

- Nuclear Instrument and Methods in Physics Research A (NIMA);
- JINST;
- Nuclear Science and Techniques (NST);
- IEEE Transactions on Dielectric and Electrical Insulation (TDEI);
- Universal Journal of Physics and Application (UJPA);
- Frontiers in Physics;
- Universe;

## **4. Laboratory duties**

- PSI piE5 beam line: Beam line responsible and project leader [2017-now]
- PSI piM1 area co-coordinator [2015-now]

- PSI piE1 area coordinator [2013- 2015];
- PSI local contact for the Alcap experiment [2013-2015];
- PSI particle and nuclear physics (LTP) seminar organiser (responsible for and chair) [2016-2018];

## 5. Membership

- IEEE Nuclear and Plasma Sciences Society Member;
- Swiss Institute of Particle Physics (CHIPP) Member;

## 6. Scientific Outreach

- Associazione Italiana Studenti di Fisica (AISF) - Fisica nei Pub a Pisa [2019]: “Oltre il modello standard con la violazione del sapore leptonico”;
- High school meetings [2018]: “L’ infinitamente piccolo e le sue simmetrie”;
- PSI Media Release [2016]: “Five hundred thousand times less likely than winning the lottery”;
- PSI Open day [2015]: Responsible for the construction of one of the exposed detectors and Visitor guide;
- Swiss Institute of particle physics (CHIPP) and Swiss Academy of Sciences (SCNAT) Media release [2014]: (teilchenphysic.ch): “Particle physics with muons at PSI”: <https://www.youtube.com/watch?v=0bEESKTDc6Q>;
- PSI Scientific Highlights [2011]: “Higgs physics and rare particle decays”;
- PSI Forum: The door to the world of science. Over 20 interactive exhibits demonstrate the projects that PSI is working on to find solutions for the challenges of the future. Visitor guide [2010 - now];
- Pisa INFN and Department of Physics Masterclass for high school students (one week/year) [2007-2009]: “Discover the world of Quarks and Leptons with real data”;
- Department of Physics, Pisa: “A night with researchers” [2004-2009]: Visitor guide;
- La ludoteca scientifica e Galileo Galilei [2004]: Plenary session: Galileo Galilei; Visitor guide;

## Schools and Additional training

**Zouz international summer school: Vision and Precision** (Lecturer), Zouz, Switzerland [2020] - postponed to 2021 due to COVID2019 outbreak;

**International school on charged lepton flavour violation** (Lecturer), IHEP Beijing, China [2019];

**GGI Theoretical Lectures on Fundamental Interactions, deep and high level courses.** Scuola Normale Superiore and INFN. Arcetri (Florence), Italy [2017];

**Quantum Atom at 100 - Niels Bohr’s Legacy.** Swiss Academy of Sciences (SCNAT). Winterthur, Switzerland [2013];

**CERN Accelerator School, Specialised course.** Zeegse, The Netherlands [2007];

**INFN XV Detector School, Specialised course.** Torino, Italy [2005];

## Publications

### Peer-reviewed journal articles

Accepted for publication:

[p80] A. M. Baldini et al. (MEG collaboration), **Eur. Phys. J. C** **80** (2020) **858**: “Search for lepton flavour violating muon decay mediated by a new light particle in the MEG experiment”;

[p79] A. Antognini, N. J. Ayres, I. Belosevic, V. Bondar, A. Eggenberger, M. Hildebrandt, R. Iwai, D. M. Kaplan, K. S. Khaw, K. Kirch, A. Knecht, A. Papa, C. Petitjean, T. J. Phillips, F. M. Piegasa, N. Ritjoho, A. Stoykov, D. Taqqu, and G. Wichmann, **Phys. Rev. Lett.** **125** (2020) **164802**: “Demonstration of Muon-Beam Transverse Phase-Space Compression”;

[p78] G.F. Tassielli, A. M. Baldini, G. Cavoto, F. Cei, M. Chiappini, G. Chiarello, A. Corvaglia, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, M. Meucci, A. Miccoli, D. Nicolò, M. Panareo, A. Papa, F. Raffaelli, F. Renga, P. Schwendimann, G. Signorelli, C. Voena, **JINST** **15** (2020) **C09051** (<https://arxiv.org/pdf/2006.02378.pdf>): “The Drift Chamber of the MEG II experiment”

Published:

[p77] M. Chiappini, A.M. Baldini, G. Cavoto, F. Cei, G. Chiarello, A. Corvaglia, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, M. Meucci, A. Miccoli, D. Nicolò, M. Panareo, A. Papa, F. Raffaelli, F. Renga, P. Schwendimann, G. Signorelli, G. F. Tassielli and C. Voena, **JINST** **15** (2020) **C06056** (<https://iopscience.iop.org/article/10.1088/1748-0221/15/06/C06056/pdf>): “Commissioning of the MEG II tracker system”;

[p76] G. Chiarello, A. M. Baldini, G. Cavoto, F. Cei, M. Chiappini, A. Corvaglia, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, M. Meucci, A. Miccoli, D. Nicolò, A. Papa, M. Panareo, F. Raffaelli, F. Renga, G. Signorelli, G.F. Tassielli, and C. Voena, **JINST** **15** (2020) **C07034** (<https://iopscience.iop.org/article/10.1088/1748-0221/15/07/C07034/pdf>): “An automatic system for the wiring of Drift Chambers for modern high intensity and high precision particle physics experiments”;

[p75] A. Antognini, N. Berger, T. E. Cocolios, R. Dressler, R. Eichler, A. Eggenberger, P. Indelicato, K. Jungmann, C. H. Keitel, K. Kirch, A. Knecht, N. Michel, J. Nuber, N. S. Oreshkina, A. Ouf, A. Papa, R. Pohl, M. Pospelov, E. Rapisarda, N. Ritjoho, S. Rocca, N. Severijns, A. Skawran, S. M. Vogiatzi, F. Wauters, and L. Willmann **Phys. Rev. C** **101** (2020) **054313** (<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.101.054313>): “The measurement of the quadrupole moment of 185-Re and 187-Re from the hyperfine structure of muonic X rays”;

[p74] A. Bravar, K. Briggli, S. Corrodi, A. Damyanova, L. Gerritzen, C. Grab, M. Hildebrandt, A. Papa, G. Rutar, **Nucl. Instr. and Meth. in Phys. Res. A** **958** (2020) **162564** (<https://www.sciencedirect.com/science/article/pii/S0168900219310861>): “The Mu3e scintillating fiber timing detector”;

[p73] A. Papa, P. Schwendimann, **Nucl. Instr. and Meth. in Phys. Res. A** **958** (2020) **162999** (<https://www.sciencedirect.com/science/article/pii/S0168900219313749>): “Development of new large calorimeter prototypes based on LaBr3(Ce) and LYSO crystals coupled to silicon photomultipliers: A direct comparison”;

[p72] M. Nishimura, F. Berg, M. Biasotti, G. Boca, P.W. Cattaneo, M. De Gerone, A. De Bari, M. Francesconi, L. Galli, F. Gatti, U. Hartmann, Z. Hodge, P.-R. Kettle, M. Nakao, D. Nicolo, W. Ootani, A. Papa, S. Ritt, M. Rossella, E. Schmid, Y. Uchiyama, M. Usami, K. Yanai, **Nucl. Instr. and Meth. in Phys. Res. A** **958** (2020) **162785** (<https://www.sciencedirect.com/science/article/pii/S0168900219312318?via%3Dihub>): “Full system of positron timing counter in MEG II having time resolution below 40 ps with fast plastic scintillator readout by SiPMs”;

[p71] A.M.Baldini, G.Cavoto, F.Cei, M.Chiappini, G.Chiarello, A.Corvaglia, M.Francesconi, L.Galli, F.Grancagnolo, M.Grassi, M.Hildebrandt, M.Meucci, A.Miccoli, D.Nicoló, A.Papa, M.Panareo, C.Pinto, F.Raffaelli, F.Renga, G.Signorelli, G.F.Tassielli, C.Voena, **Nucl. Instr. and Meth. in Phys. Res. A** **958** (2020) **162152** (<https://www.sciencedirect.com/science/article/pii/S0168900219306035>): “The ultra light Drift Chamber of the MEG II experiment”;

[p70] A.K. Perrevoort et al. (Mu3e collaboration) **Sci. Post. Phys. Proc.** **1** (2019) **052** (<https://scipost.org/SciPostPhysProc.1.052/pdf>): “The rare and forbidden: testing physics beyond the Standard Model with Mu3e”;

[p69] A. Skawran, A. Adamczak, A. Antognini, N. Berger, T. E. Cocolios, R. Dressler, C. Dullmann, R. Eichler, P. Indelicato, K. Jungmann, K. Kirch, A. Knecht, J. J. Krauth, J. Nuber, A. Papa, R. Pohl, M. Pospelov, E. Rapisarda, D. Renisch, P. Reiter, N. Ritjoho, S. Roccia, N. Severijns, S. Vogiatzi, F. Wauters and L. Willman, **IL NUOVO CIMENTO** **42 C** (2019) 125 (<https://www.sif.it/riviste/sif/ncc/econtents/2019/042/02-03/article/75>): “Towards nuclear structure with radioactive muonic atoms”;

[p68] Ryoto Iwai, Mikio Sakurai, Aldo Antognini, Ivana Belosevic, Malte Hildebrandt, Klaus Kirch, Andreas Knecht, Angela Papa, and Alexey Stoykov, **JPS Conf. Proc.** **27**, (2019) 012005 (<https://journals.jps.jp/doi/10.7566/JPSCP.27.012005>): “Characterization of Cryogenic SiPM Down to 6.5 K”;

[p67] I. Belosevic, A. Antognini, Y. Bao, A. Eggenberger, M. Hildebrandt, R. Iwai, D.M. Kaplan, K.S. Khaw, K. Kirch, A. Knecht, A. Papa, C. Petitjean, T.J. Phillips, F.M. Piegsa, N. Ritjoho, A. Stojkov, D. Taqqu and G. Wichmann, **Eur. Phys. J. C** **79** (2019) 430 (<https://doi.org/10.1140/epjc/s10052-019-6932-z>): “muCool: a next step towards efficient muon beam compression”;

[p66] A. Papa, F. Renga and Y. Uchiyama, **CERN Courier May 2019** (<https://cerncourier.com/a/hunting-the-muons-forbidden-decay/>) “Hunting the muon's forbidden decay”;

[p65] Ivana Belosevic, Aldo Antognini, Yu Bao, Andreas Eggenberger, Malte Hildebrandt, Ryoto Iwai, Daniel M. Kaplan, Kim Siang Khaw, Klaus Kirch, Andreas Knecht, Angela Papa, Claude Petitjean, Thomas J. Phillips, Florian M. Piegsa, Narongrit Ritjoho, Alexey Stoykov, David Taqqu, GuntherWichmann, **Hyperfine Interactions** **240** (2019) 41 (<https://doi.org/10.1007/s10751-019-1589-4>): “MuCool: a novel low-energy muon beam for future precision experiments”;

[p64] F. Renga, G. Cavoto, A. Papa, F. Renga, E. Ripiccini and C. Voena, **Universe** **5** (2019) 27 (<https://doi.org/10.3390/universe5010027>): “Experimental limiting factors for the search of  $\mu \rightarrow e \gamma$  at Future Facilities”;

- [p63] M. Francesconi, A.M. Baldini, F. Cei, M. Chiappini, L. Galli, M. Grassi, U. Hartmann, F. Morsani, D. Nicolò, A. Papa, S. Ritt, E. Schmid and G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 331** (<https://doi.org/10.1016/j.nima.2018.09.153>): “Low latency serial communication for MEG II trigger system”;
- [p62] L. Galli, A.M. Baldini, F. Cei, M. Chiappini, M. Francesconi, M. Grassi, U. Hartmann, M. Meucci, F. Morsani, D. Nicolò, A. Papa, S. Ritt, E. Schmid and G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 399** (<https://doi.org/10.1016/j.nima.2018.07.067>): “WaveDAQ: An highly integrated trigger and data acquisition system”;
- [p61] A. Papa, G. Rutar, F. Barchetti, M. Hildebrandt, P.-R. Kettle, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 634** (<https://doi.org/10.1016/j.nima.2018.10.145>): “A fast and quasi non-invasive muon beam monitor working at the intensity frontier”;
- [p60] P.W. Cattaneo, F. Berg, M. Biasotti, G. Boca, M. De Gerone, A. De Bari, M. Francesconi, L. Galli, F. Gatti, U. Hartmann, Z. Hodge, P.-R. Kettle, M. Nakao, D. Nicolò, M. Nishimura, W. Ootani, A. Papa, S. Ritt, M. Rossella, E. Schmid, Y. Uchiyama and M. Usami, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 660** (<https://doi.org/10.1016/j.nima.2018.09.055>): “A Development and commissioning of the 30 ps time resolution MEG II pixelated Timing Detector”;
- [p59] A. Papa, S. Bertschi, L. Künzi and G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 25** (<https://doi.org/10.1016/j.nima.2018.10.021>): “A pixelated Faraday cup for proton beam diagnostics”;
- [p58] A. Papa and P. Schwendimann, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 268** (<https://doi.org/10.1016/j.nima.2018.09.137>): “The mott based double turn method for the MEG II spectrometer characterisation”;
- [p57] G. Chiarello, G.F. Tassielli, A. M. Baldini, G. Cavoto, F. Cei, M. Chiappini, G. Coccio, A. Corvaglia, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, A. Miccoli, D. Nicolò, A. Papa, M. Panareo, C. Pinto, F. Raffaelli, F. Renga, G. Signorelli and C. Voena, **Nucl. Instr. and Meth. in Phys. Res. A**: “The measuring systems of the wires resonant frequency for the MEG II Drift Chamber”;
- [p56] G. Chiarello, A.M. Baldini, G. Cavoto, F. Cei, M. Chiappini, A. Corvaglia, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, A. Miccoli, D. Nicolò, A. Papa, M. Panareo, C. Pinto, F. Raffaelli, F. Renga, G. Signorelli, G.F. Tassielli and C. Voena, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 495** (<https://doi.org/10.1016/j.nima.2018.10.112>): “The construction technique of the new MEG II tracker”;
- [p55] M. Chiappini, A. M. Baldini, G. Cavoto, F. Cei, G. Chiarello, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, D. Nicolò, M. Panareo, A. Papa, F. Raaelli, F. Renga, G. Signorelli, G.F. Tassielli and C. Voena, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 501** (<https://doi.org/10.1016/j.nima.2018.10.182>): “The new drift chamber of the MEG II experiment”;
- [p54] A. Papa and P. Schwendimann, **Nucl. Instr. and Meth. in Phys. Res. A** **936 (2019) 130** (<https://doi.org/10.1016/j.nima.2018.10.086>): “A first large calorimeter prototype based on lanthanum bromide coupled to silicon photomultipliers: Status and prospects”;

- [p53] A. Adamczak, A. Antognini, N. Berger, T.E. Cocolios, R. Dressler, A. Eggenberd, R. Eichler, P. Indelicato, K. Jungmann, K. Kirch, A. Knecht, A. Papa, R. Pohl, M. Pospelov, E. Rapisarda, P. Reiter, N. Ritjoho, S. Rocca, N. Severijns, A. Skawran, F. Wauters and L. Willman, **Eur. Phys. J. Web Conf.** **193** (2018) 04014: “Nuclear structure with radioactive muonic atoms”;
- [p52] A. M. Baldini, E. Baracchini, G. Cavoto, F. Cei, M. Chiappini, G. Chiarello, C. Chiri, M. Francesconi, L. Galli, F. Grancagnolo, M. Grassi, M. Hildebrandt, V. Martinelli, M. Meucci, D. Nicolo, M. Panareo, A. Papa, A. Pepino, B. Pruneti, F. Raffaelli, F. Renga, E. Ripiccini, G. Signorelli, G.F. Tassielli and C. Voena, **JINST** **13** (2018) P06018: “Gas distribution and monitoring for a drift chamber of the MEG II experiment”;
- [p51] G. Cavoto, A. Papa, F. Renga, E. Ripiccini and C. Voena, **PoS** (EPS-HEP2017) 238: “Experimental limiting factors for the next generation of  $\mu \rightarrow e \gamma$  searches”;
- [p50] A. M. Baldini et al. (MEGII collaboration), **Eur. Phys. J. C** **78** (2018) 380: “The design of the MEG II experiment”;
- [p49] A. Papa, **Eur. Phys. J. Web Conf.** **179** (2018) 01018: “Charged lepton flavour violation searches at the Paul Scherrer Institut: Status of the MEGII and Mu3e experiments”;
- [p48] G. Cavoto, A. Papa, F. Renga, E. Ripiccini, C. Voena **Eur. Phys. J. C** **78** (2018) 37: “The quest for the  $\mu \rightarrow e \gamma$  and its experimental limiting factors at future high intensity muon beams”;
- [p47] K. Blaum, K. Kirch, J. Nystrand, E. Widmann, H. Stroher, H. Abele, K. Bodek, D. Budker, C. Curceanu, M. Doser, E. Lienard, K. Pachucki, R. Pohl, T. Stohlker, C. Weinheimer, L. Willmann, F. Maas, **A. Papa**, R. Timmermans, NuPECC (Nuclear Physics European Collaboration Committee) Long Range Plan 2017 Perspectives in Nuclear Physics, Book available online: <http://www.nupecc.org/lrp2016/Documents/lrp2017.pdf>; Chapter 5: “Symmetries and fundamental interactions”;
- [p46] S. Bravar, S. Corrodi, A. Damyanova, C. Grab, R. Gredig, A. Papa and G. Rutar, **JINST** **12** (2017) C07011: “Scintillating fibre detector for the Mu3e experiment”;
- [p45] A. M. Baldini et al. (MEG collaboration) **Eur. Phys. J. C** **76** (2016) 434: “Search for the lepton flavour violating decay  $\mu \rightarrow e \gamma$  with the full dataset of the MEG experiment”;
- [p44] A.M. Baldini et al. (MEG collaboration), **Eur. Phys. J. C** **76** (2016) 223: “Muon polarization in the MEG experiment: predictions and measurements”;
- [p43] A.M. Baldini et al. (MEG collaboration), **Eur. Phys. J. C** **76** (2016) 108: “Measurement of the radiative decay of polarized muons in the MEG experiment”;
- [p42] F. Berg, L. Desorgher, A. Fuchs, W. Hajdas, Z. Hodge, P.-R. Kettle, A. Knecht, R. Luscher, **A. Papa**, G. Rutar, and M. Wohlmuther, **Phys. Rev. Spec. Top. Acc. and Beams** **19** (2016) 024701: “Target studies for surface muon production”;
- [p41] **A. Papa**, P.-R. Kettle, E. Ripiccini and G. Rutar, **Nucl. Instr. and Meth. in Phys. Res. A** **824** (2016) 128: “Scintillating fibres coupled to silicon photomultiplier prototypes for fast beam monitoring and thin timing detectors”;

- [p40] G. Rutar, C. Bemporad, P.W. Cattaneo, F. Cei, L. Galli, P.-R. Kettle and **A. Papa**, **Nucl. Instr. and Meth. in Phys. Res. A 824** (2016) 575: "A dedicated calibration tool for the MEG and MEG II positron spectrometer";
- [p39] G. Signorelli, A.M. Baldini, C. Bemporad, F. Cei, L. Galli, G. Gallucci, M. Grassi, D. Nicolo, **A. Papa**, F. Sergiampietri, M. Venturini, **Nucl. Instr. and Meth. in Phys. Res. A 824** (2016) 713: "A liquid hydrogen target for the calibration of the MEG and MEGII liquid xenon calorimeter";
- [p38] A. Eggenberger, A. Antognini, I. Belosevic, M. Hildebrandt, D. M. Kaplan, K. S. Khaw, K. Kirch, A. Knecht, **A. Papa**, C. Petitjean, T. J. Phillips, F. M. Piegsa, S. Ritt, K. Sedlak, A. Stoykov, D. Taqqu and G. Wichmann, International Workshop on Antimatter and Gravity Proceedings (2016): "Development of a high-brightness low-energy positive muon beam line";
- [p37] **A. Papa**, F. Barchetti, F. Gray, E. Ripiccini, G. Rutar, **Nucl. Instr. and Meth. in Phys. Res. A 787** (2015) 130: "A multi-purposed detector with silicon photomultiplier readout of scintillating fibres";
- [p36] **A. Papa**, E. Ripiccini, and G. Rutar, **PoS** (PhotoDet2015) **009**: "High granularity scintillating tracker prototypes coupled to Silicon Photomultiplier";
- [p35] A. Bravar, **A. Papa** et al. (Mu3e Collaboration), **Nucl. Part. Phys. Proc. 260** (2015) 155: "The Mu3e experiment at PSI";
- [p34] Y. Bao, A. Antognini, W. Bertl, M. Hildebrandt, K. Siang Khaw, K. Kirch, **A. Papa**, C. Petitjean, F. M. Piegsa, S. Ritt, K. Sedlak, A. Stoykov, and D. Taqqu, **Phys. Rev. Lett. 112** (2014) 224801: "Muon cooling: longitudinal compression";
- [p33] L. Galli, A. Baldini, P. W. Cattaneo, F. Cei, M. De Gerone, S. Dussoni, F. Gatti, M. Grassi, F. Morsani, D. Nicolò, **A. Papa**, S. Ritt, G. Signorelli, **JINST 9** (2014) P04022: "Operation and performance of the trigger system of the MEG experiment";
- [p32] **A. Papa**, **J. Phys. Conf. Ser. 556** (2014) 012065: "Muon charged Lepton Flavour Violation search in Europe: the  $\mu \rightarrow e \gamma$  and the  $\mu \rightarrow e e e$  decays";
- [p31] J. Adam et al. (MEG collaboration), **Nucl. Phys. B 248-250** (Proc. Suppl.) (2014) 108: "Measurement of Inner Bremsstrahlung in Polarized Muon Decay with MEG";
- [p30] R. Sawada et al. (MEG collaboration), **Nucl. Phys. B 248-250** (Proc. Suppl.) (2014) 29: "MEG: status and upgrades";
- [p29] N. Berger et al. (Mu3e collaboration), **Nucl. Phys. B 248-250** (Proc. Suppl.) (2014) 35: "The Mu3e experiment";
- [p28] **A. Papa**, G. Cavoto and E. Ripiccini, **Nucl. Phys. B 248-250** (Proc. Suppl.) (2014) 121: "Feasibility study of an active target for the MEGII experiment";
- [p27] **A. Papa**, M. De Gerone, S. Dussoni, L. Galli, D. Nicolò, G. Signorelli, **Nucl. Phys. B 248-250** (Proc. Suppl.) (2014) 115: "Feasibility study of a high-performance LaBr3(Ce) calorimeter for future lepton flavor violation experiments";



- [p26] S. Bachmann, N. Berger, A. Blondel, S. Bravar, A. Buniatyan, G. Dissertori, P. Eckert, P. Fischer, C. Grab, R. Gredig, M. Hildebrandt, P.-R. Kettle, M. Kiehn, **A. Papa**, I. Peric, M. Pohl, S. Ritt, P. Robmann, A. Schoning, H.-C. Schultz-Coulon, W. Shen, S. Shresta, A. Stoykov, U. Straumann, R. Wallny, D. Wiedner, and B. Windelband, **JINST** **9** (2014) C01011: "The proposed trigger-less TBit/s readout for the Mu3e experiment";
- [p25] **A. Papa**, G. Cavoto, M. De Gerone, E. Ripiccini, **JINST** **9** (2014) C05066: "A simulation tool for scintillating fibres coupled to Silicon Photomultipliers for MIP and heavy ionizing particle identification";
- [p24] J. Adam et al. (MEG Collaboration), **Phys. Rev. Lett.** **110** (2013) 201801: "New constraint on the existence of the  $\mu \rightarrow e \gamma$  decay";
- [p23] J. Adam et al. (MEG Collaboration), **Eur. Phys. J. C** **73** (2013) 2365: "The MEG detector for  $\mu \rightarrow e \gamma$  decay search";
- [p22] S. Dussoni, A. Baldini, L. Galli, C. Cerri, M. Grassi, **A. Papa**, G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A** **732** (2013) 225: "R&D on a fast LXe TPC with real-time event reconstruction";
- [p21] W. Ootani et al. (MEG Collaboration), **Nucl. Instr. and Meth. in Phys. Res. A** **732** (2013) 146: "Development of pixelated scintillation detector for highly precise time measurements in MEG upgrade";
- [p20] L. Galli, M. De Gerone, S. Dussoni, D. Nicolò, **A. Papa**, F. Tenchini, G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A** **718** (2013) 48: "Timing resolution measurements of a 3 in. lanthanum bromide detector";
- [p19] **A. Papa**, G. Cavoto, E. Ripiccini, **Nucl. Instr. and Meth. in Phys. Res. A** **718** (2013) 580: "Development of an active target for the  $\mu \rightarrow e \gamma$  search";
- [p18] G. Signorelli, S. Dussoni, A. Baldini, C. Cerri, M. Grassi, **A. Papa**, F. Tenchini, **Nucl. Instr. and Meth. in Phys. Res. A** **718** (2013) 110: "The FOXFIRE liquid xenon detector research and development project"
- [p17] **A. Papa**, A. Antognini, G. Cavoto, E. Ripiccini, **PoS** (PhotoDet 2012) **045**: "Position, timing and particle ID with scintillating fibres read-out by SiPMs";
- [p16] **A. Papa**, **Proceedings of the 1st workshop on Flavour Symmetries and Consequences in Accelerators and Cosmology, FLASY 2011, ArXiv:1201.5525v1** [hep-ph], chapter 25: "A new limit of the  $\mu \rightarrow e \gamma$  decay from the MEG experiment";
- [p15] J. Adam et al. (MEG Collaboration), **Phys. Rev. Lett.** **107** (2011) 171801: "New limit on the Lepton-Flavor-Violating  $\mu \rightarrow e \gamma$  decay";
- [p14] J. Adam et al. (MEG Collaboration), **Nucl. Instr. and Meth. in Phys. Res. A** **641** (2011) 19: "Calibration and monitoring of the MEG experiment by a proton beam from a Cockcroft-Walton accelerator";
- [p13] M. De Gerone, S. Dussoni, K. Fratini, F. Gatti, R. Valle, G. Boca, P. W. Cattaneo, M. Rosella, R. Nardò, **A. Papa**, G. Signorelli, G. Cavoto, G. Piredda, F. Renga, C. Voena, Y. Uchiyama, **Nucl. Instr. and Meth. in Phys. Res. A** **630** (2011) 41: "The MEG Timing Counter Calibration and Performance";

- [p12] **A. Papa**, 11th ICATPP Conference, **Astroparticle, Particle and Space Physics, Detectors and Medical Physics Application 5** (2010) 474 World Scientific editions: "The  $\mu \rightarrow e \gamma$  decay from the MEG experiment: results from the first physics run";
- [p11] **A. Papa**, **Fizika B 20** (2011) 1, 75: "New Results on the  $\mu \rightarrow e \gamma$  decay from the MEG experiment";
- [p10] J. Adam et al. (MEG Collaboration), **Nucl. Phys. B 834** (2010) 1: "A limit for the  $\mu \rightarrow e \gamma$  decay from the MEG experiment";
- [p9] **A. Papa**, **NATO Science for peace and security Series B: Physics and Biophysics; Progress in High Energy Physics and Nuclear Safety** (2009) 185. Springer: "Search for lepton flavour violation with the MEG experiment";
- [p8] **A. Papa**, **IL NUOVO CIMENTO B 123** (2008) 860: "MEG: Lepton flavour violation in  $\mu \rightarrow e \gamma$ ";
- [p7] **A. Papa**, **IL NUOVO CIMENTO B 122** (2007) 627: "The CW accelerator and the MEG monitoring and calibration methods";
- [p6] A. Baldini, C. Bemporad, F. Cei, M. Grassi, D. Nicolò, **A. Papa**, R. Pazzi, G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A 570** (2007) 561: "A NaI activation method for the measurement of the weak thermal neutron field around the MEG experiment";
- [p5] A. Baldini, C. Bemporad, F. Cei, G. Gallucci, M. Grassi, D. Nicolò, **A. Papa**, R. Pazzi, F. Sergiampietri, G. Signorelli, **Nucl. Instr. and Meth. in Phys. Res. A 566** (2006) 294: "A cryogenic facility for testing the PMTs of the MEG liquid xenon calorimeter";
- [p4] A. Baldini, C. Bemporad, F. Cei, S. Dussoni, F. Gatti, M. Grassi, T. Haruyama, Y. Hisamatsu, T. Iwamoto, S. Mihara, T. Mori, D. Nicolò, H. Nishiguchi, W. Ootani, **A. Papa**, R. Pazzi, R. Sawada, F. Sergiampietri, G. Signorelli, R. Valle, S. Yamada, **Nucl. Instr. and Meth. in Phys. Res. A 565** (2006) 589: "A radioactive point-source lattice for calibrating and monitoring the liquid xenon calorimeter of the MEG experiment";
- [p3] A. Baldini, C. Bemporad, F. Cei, T. Doke, M. Grassi, T. Haruyama, S. Mihara, T. Mori, D. Nicolò, H. Nishiguchi, W. Ootani, K. Ozone, **A. Papa**, R. Pazzi, R. Sawada, F. Sergiampietri, G. Signorelli, S. Suzuki, K. Teresawa, **IEEE Trans. on Dielect. and Elect. Insulation 13** (2006) 547: "Liquid Xe scintillation calorimetry and Xe optical properties";
- [p2] A. Baldini, C. Bemporad, F. Cei, T. Doke, M. Grassi, T. Haruyama, K. Kasami, P-R. Kettle, A. Maki, S. Mihara, T. Mori, D. Nicolò, H. Nishiguchi, W. Ootani, K. Ozone, **A. Papa**, R. Pazzi, S. Ritt, R. Sawada, M. Schneebeli, F. Sergiampietri, G. Signorelli, S. Suzuki, K. Teresawa, M. Yamashita, S. Yamashita, T. Yoshimura, Y. Yuri, **IEEE catalog number 05CH37643** (2005) 337: "Transparency of a 100 l liquid xenon scintillation calorimeter prototype and measurement of its energy resolution for 55 MeV photons";
- [p1] A. Baldini, C. Bemporad, F. Cei, T. Doke, M. Grassi, A. A. Grebenuk, D. N. Grigoriev, T. Haruyama, K. Kasami, J. Kikuchi, A. Maki, T. Mashimo, S. Mihara, T. Mitsuhashi, T. Mori, D. Nicolò, H. Nishiguchi, W. Ootani, K. Ozone, **A. Papa**, R. Pazzi, S. Ritt, R. Sawada, F. Sergiampietri, G. Signorelli, S. Suzuki, K. Teresawa, M. Yamashita, S. Yamashita, T. Yoshimura, Y. Yuri, **Nucl. Instr. and Meth. in Phys. Res. A 545**

(2005) 753: "Absorption of scintillation light in a 100 l liquid xenon  $\gamma$ -ray detector and expected detector performance";

### **Other relevant documents and publications**

- [op11] A. Baldini, D. Glenzinski, F. Kapusta, Y. Kuno, M. Lancaster, J. Miller, S. Miscetti, T. Mori, A. Papa, A. Schoning, Y. Uchida, "Charged Lepton Flavour Violation using Intense Muon Beams at Future Facilities" arXiv: 1812.06540v1 (2018);
- [op10] F. Bernlochner F. Bernlochner, A. Crivellin, I. de Medeiros Varzielas, S. Descotes-Genon, M. Fael, D. Ghosh, A. Greljo, M. Hoferichter, G. Isidori, U. Langenegger, M. Misiak, M. Mulder, U. Nierste, A. Papa, M. Rama, P. Reznicek and D. Straub: "Impact of  $B \rightarrow \mu \mu$  on New Physics Searches" arXiv:1803.10097v1 (2018) ;
- [op9] A. Antognini, N. Berger, D. vom Bruch, P. Indelicato, K. Jungmann, K. Kirch, A. Knecht, A. Papa, R. Pohl, M. Pospelov, E. Rapisarda, N. Severijns, F. Wauters, and L. Willmann, Experiment Proposal for BVR 47 at PSI: "Measurement of the charge radius of radium" (2016);
- [op8] A. Antognini et al. (muCool collaboration), Status Report for the PSI experiment R-14-02.1: "High-brightness ultra-cold positive muon beam";
- [op7] F. Berg et al. (HIMB collaboration), Status Report of the HIMB project: "HIMB status";
- [op6] A.M. Baldini et al. (MEG Collaboration), arXiv:1301.7225 [physics.ins-det]: "MEG Upgrade Proposal";
- [op5] A. Blondel et al. (Mu3e Collaboration), arXiv:1301.6113 [physics.ins-det]: "Research Proposal for an experiment to search for the decay  $\mu \rightarrow eee$ ";
- [op4] A. Blondel et al. (Mu3e Collaboration), Letter of Intent for an Experiment to Search for the decay  $\mu \rightarrow eee$  ([https://www.psi.ch/mu3e/DocumentsEN/LOI\\_Mu3e\\_PSI.pdf](https://www.psi.ch/mu3e/DocumentsEN/LOI_Mu3e_PSI.pdf));
- [op3] A. Papa, PhD thesis, Edizioni ETS 2010: "Search for the lepton flavour violation in  $\mu \rightarrow e\gamma$ . The calibration methods for the MEG experiment" (<https://meg.web.psi.ch/docs/theses/Angela.pdf>);
- [op2] A. Papa, Specialisation Thesis, March 2004: "Measurement of the gamma in the MEG experiment with the Large Prototype of the liquid xenon calorimeter";
- [op1] A. Papa, Master Thesis, March 2003: "The liquid xenon calorimetry and its application in the MEG experiment"

### **Invited talks, seminars and conferences**

[co86] **Muon cooling workshop 2020, CERN - virtual workshop, Switzerland:** (personal invitation, plenary) "Studies on Bunch compression at PSI"

[co85] **Gamma Factory workshop 2020, Mainz - virtual workshop, Germany:** (personal invitation, plenary) "Physics with Muon Beams"

[co84] **Snowmass Community Planning Meeting 2020, Fermilab - virtual workshop, USA:** (personal invitation, plenary) "Existing beam lines and future possibilities at PSI and TRIUMF"

[co83] **Snowmass Community Planning Meeting 2020, Fermilab - virtual workshop, USA:** (plenary) "MEGII at PSI and future developments"

[co82] **International Conference on High Energy Physics ICHEP2020, Prague - virtual workshop, Czech Republic:** “The HiMB project at PSI: Status and new installed production target”

[co81] **Mainz QUANTUM Seminar (2020), Mainz - virtual workshop, Germany:** (personal invitation, plenary) “cLFV searches with the MEGII experiment and future developments at PSI”

[co80] **Physics Beyond Colliders meets Theory (2020), CERN - virtual workshop, Switzerland:** (personal invitation, plenary) “cLFV searches with the MEGII and the Mu3e experiments and future prospects”

[co79] **International Conference on Technology and Instrumentation in Particle Physics (TIPP2020), TRIUMF, Canada:** (personal invitation, plenary) “Low energy searches: Rare decay and rare processes overview” [COVID affected - deleted]

[co78] **International Conference on Technology and Instrumentation in Particle Physics (TIPP2020), TRIUMF, Canada:** “The Mu3e scintillating fibre detector” [COVID affected - deleted]

[co77] **Pioneering symposium on Muon Physics in Korea (2020), Villigen, Switzerland:** (personal invitation, plenary) “New Developments on muon beams and muonium production for future precision muonium experiments” [COVID affected - postponed]

[co76] **Kick-off workshop for the search of a muon EDM using the frozen spin technique at PSI (2020), Villigen, Switzerland:** (personal invitation, plenary) “Scintillator based detector developments for the most recent muon physics searches”;

[co75] **Physics of fundamental Symmetry and Interactions PSI2019, Villigen, Switzerland:** (personal invitation, plenary) “Overview of worldwide efforts in the search for charged lepton flavour violation”;

[co74] **Muon Collider Workshop 2019, CERN, Switzerland:** (personal invitation, plenary) “Current and incoming (HiMB) status of PSI facilities at PSI and high brightness muon beams (muCool)”;

[co73] **International workshop on Baryon and Lepton number Violation, BLV2019, Madrid, Spain:** (personal invitation, declined) “cLFV search overview”;

[co72] **XXV International Symposium Particle physics, String theory and COSmology PASCOS 2019, Manchester, UK:** (personal invitation, declined) “cLFV search overview”;

[co71] **The 10th Anniversary J-PARC Symposium 2019:** (personal invitation, plenary) “Towards a High intensity Muon Beam (HiMB) and novel high brightness muon beams (muCool) at PSI”;

[co70] **Flavour Physics and Conserving Processes - FCCP 2019, Anacapri, Italy:** (invited, plenary) “Status of the MEGII and Mu3e experiments and future prospects”;

[co69] **American Physical Society on Particles and Fields - APS 2019, Boston, USA:** “Charged lepton flavour violation search with the Mu3e apparatus”;

[co68] **European Physical Society on High Energy Physics - EPS-HEP 2019, Ghent, Belgium:** “The High Intensity Muon Beam project at PSI”;

[co67] **European Physical Society on High Energy Physics - EPS-HEP 2019, Ghent, Belgium:** “The Mu3e experiment”;

[co66] **International School on charged lepton flavour violation 2019 - Institute of High Energy Physics, Beijing, China:** (invited, lectures) “Charged lepton flavour violation searches with the MEGII and the Mu3e experiments”;

[co65] **Flavour 2019: New Physics in flavour from LHC to Belle II - MIAPP 2019, Max Planck Institute for Astro- and Particle Physics, Munich, Germany:** (invited, plenary) “Muon lepton flavour violating searches overview”;

[co64] **XVIII International Workshop on Neutrino Telescopes 2019 - Venice, Italy:** (invited, plenary) “Flavour Physics with Low Energy Muon Beams”;

[co63] **15th Vienna Conference on instrumentation - Vienna University of Technology, Vienna, Austria, VCI2019:** “Development of a new large calorimeter prototypes based on LaBr(Ce) and LYSO crystals coupled to silicon-photomultipliers. Monte Carlo simulations: A direct comparison”;

[co62] **CERN, 2019** - review of the CERN recognised experiments (invited, plenary): “Status of the MEGII/RE12 experiment at PSI”

[co61] **Department of physics - Virginia Tech, Blacksburg, USA, NUFAC 2018:** (invited, plenary) “Muon Physics review based on continuous beams”;

[co60] **Department of physics - Virginia Tech, Blacksburg, USA, NUFAC 2018:** “Towards an High Intensity Muon Beam (HiMB) at PSI”;

[co59] **Department of physics - Virginia Tech, Blacksburg, USA, NUFAC 2018:** “Status of the MEGII experiment at PSI”;

[co58] **Department of physics - Aachen University, Germany 2018** (invited seminar): “Status of the MEGII experiment and the quest for  $\mu \rightarrow e\gamma$  and its experimental limiting factors at future high intensity muon beams”;

[co57] **International Conference on High Energy Physics ICHEP2018:** “The quest for  $\mu \rightarrow e\gamma$  and its experimental limiting factors at future high intensity muon beams”;

[co56] **International Conference on High Energy Physics ICHEP2018:** “The Mu3e scintillating fiber tracker R&D”;

[co55] **International Conference on High Energy Physics ICHEP2018:** “Status of the Mu3e experiment at PSI”;

[co54] **International Conference on High Energy Physics ICHEP2018:** “The MEGII experiment at PSI”;

[co53] **Origin of Mass at the High Energy and Intensity Frontier - University of Southern Denmark, Odense, Denmark (MASS 2018)** (invited talk, plenary session): “Overview over the current facilities and

future developments for producing high intensity muon beams and their impact on searches for charged lepton flavor violation and the precision measurement of the anomalous magnetic moment of the muon”;

[co52] **Department of physics - Bern University, Switzerland 2018** (invited seminar): “Precision physics at PSI with the most intense muon beam: The MEGII experiment”;

[co51] **Department of physics - Mainz University, Germany 2018** (invited seminar): “Overview of the PSI accelerator machine and status of the MEGII experiment”;

[co50] **Impact of B -> mu mu on New Physics Searches - PSI, Switzerland 2017** (invited talk, plenary session): “Overview on mu -> e experiments”;

[co49] **High Resolution and High Rate detectors in Nuclear and Particle Physics Workshop, Universität Heidelberg, Germany (VISTA 2017)** (invited talk, plenary session): “Charged lepton flavour violation searches at PSI”;

[co48] **European Committee for Future Accelerators (ECFA) Seminar 2017 - Geneva, Switzerland** (invited talk, plenary session): “Charged lepton flavour violation searches: An overview”;

[co47] **International Committee for Future Accelerators (ICFA) Seminar 2017 - Ottawa, Canada:** “Precision physics at the Intensity Frontiers”;

[co46] **IEEE Nuclear Science Symposium and Medical Imaging Conference - Atlanta, USA (IEEE2017):** “The Mu3e scintillating fiber tracker”;

[co45] **Workshop on Neutrinos from Accelerators - Uppsala University in Sweden (NUFACT2017)** (invited talk, plenary session): “Muon Physics Summary Talk (Working Group IV)”;

[co44] **Workshop on Flavour Changing and Conserving Processes - Capri Island, Italy (FCCP2017)** (invited talk, plenary session): “Status of Mu3e and MEGII experiments”;

[co43] **The 26th International Workshop on Weak Interactions and Neutrinos - University of California in Irvine 2017 (WIN2017)** (invited talk, plenary session): “Flavour and Precision Physics Summary Talk - experimental view (Working Group III)”;

[co42] **The 26th International Workshop on Weak Interactions and Neutrinos - University of California in Irvine 2017 (WIN2017)** (invited talk): “The final MEG result. Towards MEGII”;

[co41] **The 26th International Workshop on Weak Interactions and Neutrinos - University of California in Irvine 2017 (WIN2017)** (invited talk, plenary session): “The Mu3e experiment”;

[co40] **Department of Physics and Astronomy - Universität Heidelberg 2016** (invited seminar): “The  $\mu \rightarrow e \gamma$  decay search with the full data set of the MEG experiment and status of the MEG II experiment”;

[co39] **Imperial College London 2016** (invited seminar): “The  $\mu \rightarrow e \gamma$  decay search with the full data set of the MEG experiment and status of the MEG II experiment”;

[co38] **IEEE Nuclear Science Symposium and Medical Imaging Conference (IEEE2016)**, Strasbourg, France: “A New Large Calorimeter Based on Lanthanum Bromide Coupled to Silicon Photomultipliers: Monte Carlo Simulation Predictions”;

[co37] **IEEE Nuclear Science Symposium and Medical Imaging Conference (IEEE2016)**, Strasbourg, France: “High Granularity Scintillating Fibre Trackers Based on Silicon Photomultiplier”;

[co36] **Physics of fundamental Symmetries and Interactions (PSI2016)** (invited talk, plenary session), PSI Villigen, Switzerland: “The  $\mu \rightarrow e \gamma$  decay search with the full data set of the MEG experiment and status of the MEG II experiment”;

[co35] **Neutrino Oscillation Workshop (NOW2016)** (invited talk, plenary session) Otranto, Italy: “Overview on cLFV searches and the MEG result with the full data sample”;

[co34] **XVIII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2016)**, (invited talk, plenary session) Qui Nhon, Vietnam. Summary talk for the Working Group 4: “Muon and Neutrino Physics Overview and future prospects”;

[co33] **XVIII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2016)**, (invited talk, plenary session) Qui Nhon, Vietnam. Opening talk for the Working Group 4: “Muon and Neutrino Physics”;

[co32] **XVIII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2016)**, Qui Nhon, Vietnam: “Status of the MEGII and Mu3e experiments at PSI”;

[co31] **XVIII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2016)**, Qui Nhon, Vietnam: “The muCool experiment at PSI”;

[co30] **Strategy Workshop on High-Energy Particle Physics in Switzerland (SWHEPPS 2016)**, (invited talk, plenary session), Unterageri, Switzerland: “Searches on charged Lepton Flavour Violation with muons and Time-reversal symmetry Violation with neutrons”;

[co29] **ETH-PSI colloquium (2016)**, PSI Villigen, Switzerland (invited colloquium): “The  $\mu \rightarrow e \gamma$  decay search with the full data set of the MEG experiment”;

[co28] **Restricted European Committee for Future Accelerators (RECFA) visit to Switzerland (RECFA2016)**, (invited talk, plenary session) ETH Zurich, Switzerland: “Low energy precision experiments in Switzerland”;

[co27] **The international workshop on future potential of high intensity proton accelerator for particle and nuclear physics (HINT2015)**, (invited talk, plenary session) Tokai-Village, J-PARC, Japan: “Status and future prospects of the  $\mu \rightarrow e \gamma$  and the  $\mu \rightarrow e e e$  experiments”;

[co26] **XVII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2015)**, Rio de Janeiro, Brazil. Opening talk for the Working Group 4 (invited talk, plenary session): “Muon and Neutrino Physics”;

- [co25] **XVII International Workshop on Neutrino Factories and Future Neutrino Facilities (NuFact2015)**, Rio de Janeiro, Brazil: "Status of the MEGII experiment at PSI";
- [co24] **Weak Interaction and Neutrinos (WIN 2015)**, MPIK Heidelberg, Germany: "The MEGII and Mu3e experiments";
- [co23] **Laboratoire de Physics Corpusculaire Clermont-Ferrand (2014)**, (invited seminar) Clermont-Ferrand, France: "The MEG experiment and its upgrade";
- [co22] **XI International conference on hyperons, charm and beauty hadrons (BEACH2014)** (invited talk, plenary session), Birmingham, England: "Muon charged Lepton Flavor Violation search in Europe: the  $\mu \rightarrow e \gamma$  and the  $\mu \rightarrow e e e$  decays";
- [co21] **New Developments In Photo-detection (NDIP 2014)** (plenary session), Tours, France: "A multi-purposed detector with silicon photomultiplier readout of scintillating fibres";
- [co20] **Physics of fundamental Symmetries and Interactions at low energies and the precision frontier (PSI 2013) and Swiss Institute of particle physics (CHIPP) Detector R&D Workshop 2013** (plenary session), PSI Villigen, Switzerland: "Detector R&D for the MEGII experiment";
- [co19] **16th Lomonosov Conference 2013** (invited talk, plenary session), Moscow University, Russia: "The existence of the  $\mu \rightarrow e \gamma$  decay from B. Pontecorvo to date: new constraint by the MEG experiment";
- [co18] **Latsis Symposium 2013** (invited talk, plenary session), **ETH Zurich**, Switzerland: "Latest news from the MEG experiment";
- [co17] **Department of Physics and Astronomy, University of California-Irvine (2013)**, (invited seminar): "The Mu3e experiment";
- [co16] **Paul Scherrer Institute, Laboratory for particle physics (2012)**, (seminar), PSI Villigen, Switzerland: "The detector R&D for the MEGII experiment";
- [co15] **Dipartimento di Fisica, Università di Roma "La Sapienza" (2012)**, Rome, Italy (invited seminar): "The Mu3e experiment";
- [co14] **Swiss Institute of Particle Physics and Swiss Physical Society Annual plenary meeting (CHIPP 2012)**, (invited talk, plenary session) Ittingen, Switzerland: "Muon physics and rare decays";
- [co13] **The 20th International Conference on Supersymmetry and the Unification of fundamental Interactions (SUSY 2012)**, Beijing, China: "A new upper limit on the  $\mu \rightarrow e \gamma$  decay from the MEG experiment";
- [co12] **Flavor Symmetries and consequences in Accelerators and Cosmology (FLASY 2011)** (invited talk, plenary session), Valencia, Spain: "The  $\mu \rightarrow e \gamma$  decay: waiting for the new results by the MEG experiment";
- [co11] **Laboratori Nazionali del Gran Sasso 2010**, L'Aquila, Italy (invited seminar): "The calibration methods of the MEG experiment";



[co10] **Conference on Nuclear and Particle Physics (NAPP 2010)** , Dubrovnik, Croatia (invited talk, plenary session): "New Results on the  $\mu \rightarrow e \gamma$  decay";

[co9] **Swiss Institute of Particle Physics and Swiss Physical Society Annual plenary meeting (CHIPP 2010)**, Gersau, Switzerland (invited talk, plenary session): "New Results on the  $\mu \rightarrow e \gamma$  decay";

[co8] **Physics department, the University of Pisa (2009)** (invited seminar): "The search of the charged lepton flavour violation with the MEG experiment: the first period of data acquisition";

[co7] **11th Conference on Astroparticle, Particle, Space Physics and Detectors for Physics Applications (ICATPP 2009)**, Como, Italy (invited talk, plenary session): "The  $\mu \rightarrow e \gamma$  decay from the MEG experiment: results from the first physics run";

[co6] **New Trends in high energy physics 2008**, Yalta, Ukraine (invited talk, plenary session): "Search for lepton flavor violation with the MEG experiment";

[co5] **High energy Physics conference (IFAE 2008)**, Bologna, Italy: "MEG: lepton flavour violation in  $\mu \rightarrow e \gamma$ ";

[co4] **Congresso Nazionale della Società italiana di Fisica (SIF 2007)**, Pisa, Italy: "The CW accelerator and the MEG monitoring and calibrations";

[co3] **Laboratory for Particle Physics, LTP seminars**, PSI Villigen, Switzerland: since 2012 at least one presentation/year about my research activity;

[co2] **Annual meeting report in front of the research committee for particle physics at the Ring Cyclotron (PSI)**, Villigen, Switzerland: since 2010 at least one presentation/year about one of the experiments in which I am involved;

[co1] **Annual meeting "Lepton Flavor Physics with the Most Intense Muon Beam"**, University of Tokyo, Japan: since 2007 at least one presentation/year about special topics associated with cLFV searches.

## Other Conferences and Workshops

[cowo11] **Workshop on Muonic Atom Spectroscopy (2016)**, PSI Villigen, Switzerland;

[cowo10] **Physics of fundamental Symmetries and Interactions (PSI2016)**, PSI Villigen, Switzerland: "The fibre tracker R&D for the Mu3e experiment";

[cowo9] **Physics of fundamental Symmetries and Interactions (PSI2016)**, PSI Villigen, Switzerland: "The calibration and monitoring methods of the MEG experiment and its upgrade";

[cowo8] **XXVII International conference on neutrino physics and astrophysics (Neutrino2016)**, London, England: "Charged lepton flavour violation with the  $\mu \rightarrow e \gamma$ : The MEG result with the full data sample";

[cowo7] **Review for the Laboratory for Particle Physics at the Paul Scherrer Institute (2016)**, PSI Villigen, Switzerland: “MEG/MEGII and Mu3e at PSI”;

[cowo6] **Frontier Detectors for Frontier Physics 2015**, La Biodola, Italy: “Scintillating fibre and silicon photomultiplier prototypes for fast beam monitoring and thin timing detectors”;

[cowo5] **1st Conference on charged Lepton Flavour Violation 2013**, Lecce, Italy: “Feasibility study of a high-performance LaBr3(Ce) calorimeter for future lepton flavour violation experiments”;

[cowo4] **1st Conference on charged Lepton Flavour Violation 2013**, Lecce, Italy: “An active target for the MEGII experiment”;

[cowo3] **Physics of fundamental Symmetries and Interactions (PSI2013)**, PSI Villigen, Switzerland: “The calibration and monitoring methods of the MEG experiment”

[cowo2] **International workshop on New Photon-detectors (Photodet 2012)**, LAL Orsay, France: “Position, timing and particle ID with scintillating fibres readout by SiPM”;

[cowo1] **Frontier Detectors for Frontier Physics 2012**, La Biodola-Italy: “An active target for the MEGII experiment”;

## Summary of all my research activity and scientific achievement

### Introduction

Particle physics aims at understanding the nature of the fundamental particles that constitute matter and their interactions. The Standard Model (SM) supplemented with massive neutrinos and enriched by the latest great discovery of the Higgs boson at the Large Hadron Collider (LHC), summarises our present best knowledge of particle physics. In spite of its extraordinary success in being able to account for a huge bulk of experimental data, there exist both strong theoretical reasons and significant observational hints for new physics Behind SM.

Theories beyond the Standard Model are trying to answer these questions and experimental efforts will provide the opportunities to discover a coherent framework for many of the long-standing puzzles of the field.

Different experimental approaches can be pursued to address these fundamental physics questions. One powerful way is to search for processes which are forbidden in the SM or strongly suppressed (rare). Among the others, charged lepton flavour violation processes such as  $\mu \rightarrow e \gamma$ ,  $\mu \rightarrow e e e$  and muon conversion in nuclei are very sensitive probes: An evidence of such a processes at the current achievable experimental sensitivities would be a clear evidence of new physics .

Searching for new physics and contributing to unlock the secrets of the universe thinking about and performing very sensitive and elegant experiments are few of the main motivations which drive my research.

*cLFV searches with the MEG/MEGII experiments:*

My research activity started searching for new physics evidence beyond Standard Model via lepton flavour violation in charged lepton decays, looking at the  $\mu \rightarrow e \gamma$  decay. I am a member of the MEG collaboration since 2003 and member of the MEGII collaboration. In MEG I covered several responsibilities (calibration and monitoring methods [including special devices as a Cockcroft-Walton accelerator and its beam line, a Neutron Generator etc.], beam lines, shift coordination, detector calibration analysis), coordinated and worked on different tasks, from the new liquid xenon calorimeter up to spectrometer and finally to the analysis [op1, op2, op3, p1, p2, p3, p4, p5, p6, p7, p8, p9, p11, p12, p13, p22, p32, p36, co4, co11, co19]. I'm carrying out the upgrade program of the MEG experiment (MEGII experiment), extending the previous tasks with new leaderships (new auxiliary detectors, exotic physics, upgrade of the calibration and monitoring methods of MEG) [op6, p20, p24, p27, p29, p36, p37, p38, co21]. The MEG experiment has recently set the most stringent limit on the  $\mu \rightarrow e \gamma$  branching ratio [p10, p14, p22, p23, p29, p30, p40, p41, p42, co1, co2, co3, co5, co6, co7, co8, co9, co10, co12, co18, co29, co34]. It is a factor 30 improvement over the previous limit set by the MEGA experiment and also the strongest bound on any forbidden decay particle. The compelling scientific motivation of such a research area has pushed the MEG collaboration for an upgrade of the experiment. The MEGII experiment aims at increasing the sensitivity of observing the cLFV decay  $\mu \rightarrow e \gamma$  by an order-of-magnitude over the MEG's one [op6, co16, co20, co22, co23, co24, co25, co27, co32].

*cLFV searches with the Mu3e experiment:*

I increased my effort on searching for charged lepton flavour violating (cLFV) processes adding in my activity the search for another muonic cLFV "golden" channel: the  $\mu \rightarrow eee$  decay. In fact only a combined phenomenological analysis of these processes, together with another very sensitive muon channel: the muon conversion in nuclei, can discriminate the underlying operators that generate a potential signal, given that the sensitivities of different processes to these operators are not the same. I was a member of the Mu3e proto-collaboration and member of the Mu3e collaboration since the beginning. I'm covering the responsibility of the fibre hodoscope tracker and coordinating the development of the Monte Carlo simulation, Analysis frameworks and reconstruction algorithms [op4, op5, p25, p28, p31, p34, p35, p38, co36]. The Mu3e experiment aims at reaching a sensitivity of observing the  $\mu \rightarrow eee$  decay by four orders of magnitudes over the best upper limit obtained by the SINDRUM experiment [op4, op5, p28, co2, co3, co17, co22, co24, co27, co32, co34, co35, cowo2, cowo5, cowo6]. To match these request the experiment has been designed using completely new technologies (such as High-Voltage Monolithic Active Pixel, SiPMs etc.). In order to achieve the ultimate sensitivity a new DC high intensity muon beam line must be developed (increasing the current highest beam intensity at least by an order-of-magnitude).

*A novel low-energy, high-brightness positive muon beam line for future projects with muons and muonium:*

I am also interested in accelerator physics and the rich physics program that can be covered at meson factories, which includes both particle and atomic physics. I am working at the feasibility study of high brightness ultra-low energy muon beams. Here just a small fraction of experiments that could benefit greatly from such a beam-lines: muon anomalous magnetic moment, muon electric dipole moment, muonium spectroscopy, antimatter with muonium, muSR applications etc. I was one of the few people that initiated that experimental activity at PSI, carrying out the first tests that provided the proof-of-principle of such approach. I am now member of the ultra-cold muon beam collaboration (muCool collaboration), being involved in the Data Analysis and Acquisition, the construction of the Timing Detectors and participating to the data taking periods. The results achieved up to now look very promising [op8, p33, co2, co28, co30, co31,co71,co74,co77,p65,p67,p78].

*Development of a new DC high intensity muon beam-line for future cLFV searches and muSR applications:*

I extended my interest in accelerator physics becoming a member of the high intensity muon beam (HiMB) group, with the aim of improving the current muon facility performances increasing the present muon beam intensities at least by two orders of magnitude, up to  $10^{10}$  muon/s [op7, p39]. This will keep the PSI at the worldwide forefront of muon facilities and ensure an exciting program of experimental activities. I'm carrying out the responsibility for developing beam diagnostic devices able to work at the highest continuous muon beam intensities in the world and investigating of permanent magnet solution along the beam line. Several beam monitoring prototypes have been build and tested [cowo2, cowo5, co1, co2, co3]. The first "in scale" beam monitoring detector based on scintillating fibres coupled to SiPMs, able to work in high magnetic field region, in vacuum, with "minimal interference" with the incoming beam, able to distinguish among incident particles and providing online beam profiles and rates has been built and successfully tested last year. An important milestone if the project has been achieved during the 2019, with the successful test of the new muon production target. The new target is the current main muon production target at PSI [co71,co74,co77,co82].

*Detector R&D and new technologies:*

Detector physics is one of my favorite subjects in the framework of particle physics research: It represents one of the crucial aspects, together with accelerators/particle sources and brilliant idea about the physical process to be studied, of particle physics searches. I started with the development, construction and commissioning of the new LXe calorimetry for the MEG experiment and I continued building new detectors and experimental setups to meet the requests of the several experiments in which I am involved [p1, p2, p3, p4, p5, p6, p7, p13, p20, p22, p32, p36, p39, op1, op2, op3, co1, co2, co3, co4, co11, co16]. I am promoter of new experimental techniques. I had the leadership of the detector R&D based on scintillating fibre coupled to SiPM, where for the first time the thinnest available fibres were coupled to individual photosensor such as each fibre works as an independent detector. That studies turned out on developing detectors for MEGII, Mu3e, muCool and HiMB [p16, p18, p24, p34, p35, p38, cowo1, cowo2, cowo3, cowo5, co1, co2, co3, co21]. I am the promotor of the feasibility study about a large LaBr<sub>3</sub>(:Ce) calorimeter

coupled to SiPM for future cLFV searches [p19, p26, cowo4, co1, co2, co3, p54, p58, p72]. I started a new detector R&D focused on p-Terphenyl doped scintillators for thinnest and highest light yield plastic scintillators. I supported the FOXFIRE detector R&D project aiming at extending the combined usage of both scintillation light and charge collection in liquid xenon calorimeters towards high-rate, high energy (tens of MeV) environments [p17, p21, co2, co3].

*New projects:*

Most recently I started to think about a possible new project: the feasibility study of a new measurement of the neutron lifetime to be performed at PSI. Actually this proposal represented to me the first occasion to get in touch - from the research point of view - with the neutrons, the other major actor in the framework of the world's most intense particle sources available at PSI. Initial studies converged in a first Master thesis on the subject, that I supervised.

Furthermore we considered the time to be mature for starting a quantitative feasibility study on a muon electron dipole moment measurement at PSI with current and future beams. I enthusiastically accepted this new challenge with converged in a first kick-off meeting at PSI at the beginning of 2020, for which I was one of the scientific and advisor committee member.

Sincerely,

Pisa, 18.February.2021

Angela Papa