

## INFORMAZIONI PERSONALI

## Alessandra Guglielmetti

## POSIZIONE RICOPERTA

Da 1/10/2014 Professore di Seconda Fascia Confermato presso l'Università degli Studi di Milano, settore scientifico disciplinare FIS 04 (Fisica Nucleare e Subnucleare). Settore concorsuale 02-A1- Fisica sperimentale delle interazioni fondamentali

Abilitazione Scientifica Nazionale Prima fascia (professore ordinario) Settore concorsuale 02-A1- Fisica sperimentale delle interazioni fondamentali conseguita nella tornata 2012 (scadenza 23/01/2020). conseguita nel quinto quadriennio della tornata 2016 (scadenza 05/10/2024).

## ESPERIENZA PROFESSIONALE

1/10/2011-30/9/2014 Professore di Seconda Fascia presso l'Università degli Studi di Milano, settore scientifico disciplinare FIS 04 (Fisica Nucleare e Subnucleare). Settore concorsuale 02-A1- Fisica sperimentale delle interazioni fondamentali

1/3/2005-30/9/2011 Ricercatore universitario confermato presso l'Università degli Studi di Milano, settore scientifico disciplinare FIS 04 (Fisica Nucleare e Subnucleare).

1/3/2002-28/2/2005 Ricercatore universitario presso l'Università degli Studi di Milano, settore scientifico disciplinare FIS 04 (Fisica Nucleare e Subnucleare).

1/3/1999-28/2/2002 Assegno di ricerca rettorale, attribuito tramite concorso, presso l'Università degli Studi di Milano

1/12/1997-28/2/1999 Borsa di Studio Ministeriale di Post Dottorato presso l'Università degli Studi di Milano, attribuita tramite concorso

1/9/1995-30/11/1997 Contratto ex-articolo 26 presso l'Università degli Studi di Milano

1/3/1995-31/8/1995: Post-doc presso GSI Darmstadt (Germania) nel gruppo del Prof. E. Roeckl

## ISTRUZIONE E FORMAZIONE

Dottorato di Ricerca in Fisica, Università degli Studi di Milano, 1995, giudizio ottimo

Laurea in Fisica, Università degli Studi di Milano, 23/11/1990, votazione 107/110

Diploma di maturità scientifica, Milano, 1985, votazione 60/60

## COMPETENZE PERSONALI

Lingua madre Italiano

## Altre lingue

	COMPRENSIONE		PARLATO		PRODUZIONE SCRITTA
	Ascolto	Lettura	Interazione	Produzione orale	
Inglese	C1	C1	C1	C1	C1
Tedesco	A1	A1	A1	A1	A1

**Competenze organizzative e gestionali****Attività di valutazione**

- Membro della Commissione di Ateneo per le Biblioteche (Università degli Studi di Milano) dal 24/7/2018

- Presidente della Commissione scientifica del Settore Biblioteche scientifiche (Università degli Studi di Milano) dal 24/5/2018

- Direttore scientifico del consiglio della Biblioteca di Fisica (Università degli Studi di Milano) dal 1/10/2016 e membro effettivo del Consiglio della Biblioteca di Fisica dal 2004

- Membro del Consiglio dei Docenti per il Dottorato in Fisica nominato dal Rettore da ottobre 2007.

Nel 2013 ho fatto parte dei 16 membri del collegio docenti del corso di dottorato in fisica, astrofisica e fisica applicata dell'Università degli studi di Milano selezionati in base a documentati risultati di ricerca in termini di "originalità e di riconoscimento internazionale dell'attività scientifica" (linee guida Anvur e MIUR).

- Coordinatore della Sezione "Fisica del Nucleo" ed in seguito Referente del gruppo "Fisica del Nucleo" del Dipartimento di Fisica dal 2010

- Membro della commissione paritetica dal 2013

- Membro della commissione programmazione per posti di ricercatore a Tempo Determinato (Dipartimento di Fisica UNIMI, 2011)

- Membro del collegio di disciplina per la fascia dei Professori Associati di UNIMI per il triennio 2015-2018

- Membro della commissione della Facoltà di Scienze Matematiche Fisiche e Naturali dell'Università degli Studi di Milano "Valutazione della didattica" (2008-2010)

- Rappresentante dei ricercatori in Giunta di Facoltà per il triennio 2008/2009-2010/2011

- Membro della commissione paritetica per la stesura del regolamento della laurea triennale in fisica, con particolare riferimento alla ristrutturazione dei corsi di laboratorio del secondo anno, a.a. 2007/08

- Referee di Physical Review Letters, Physical Review C, Nuclear Physics A, European Physical Journal A, Applied Radiation and Isotopes

- Membro della commissione per l'assegnazione del premio nazionale INFN "Claudio Villimiglior tesi di Dottorato di ricerca in fisica nucleare sperimentale" per l'anno 2013

- Membro della commissione per un posto di ricercatore RTDA presso l'Università degli Studi di Napoli Federico II (2013)

- Membro della commissione d'esame finale per il XXVI ciclo di dottorato a Genova (2014)

- Membro della commissione d'esame finale per il dottorato all'Università dell'Insubria (2014)

- Membro della commissione giudicatrice per l'acquisto dell'acceleratore da 3.5MV del Progetto Premiale LUNA MV (2015)

- Membro della commissione per un posto di primo tecnologo presso i LNGS per le esigenze del Progetto LUNA MV (2015)

- Membro della commissione per un posto di collaboratore tecnico E.R. di VI livello professionale presso i LNGS (2017)

- Referee per la VQR 2011-2014

- Valutatore dei progetti FARE 2016 per il MIUR

- Membro dell'"Advisory panel for the new 5 MV underground accelerator in Felsenkeller (Dresden, Germany)"

- Membro della commissione per un posto di ricercatore RTDB presso l'Università degli Studi di Padova (2017)

**Competenze professionali****Attività di ricerca****Attività didattica**

Attualmente mi occupo di astrofisica nucleare sperimentale nell'ambito della collaborazione LUNA, finanziata dalla commissione scientifica nazionale 3 dell'INFN. Tale collaborazione ha installato presso i Laboratori Nazionali del Gran Sasso (LNGS) due acceleratori di particelle con i quali è stato possibile, negli ultimi 25 anni, misurare le sezioni d'urto di alcune reazioni nucleari di interesse astrophysico ad energie coincidenti o molto prossime a quelle stellari. A tali energie le sezioni d'urto sono estremamente basse e la loro misura è possibile solo in un laboratorio "underground", qual è LNGS, dove il fondo cosmico è notevolmente ridotto. In particolare sono state studiate reazioni chiave per il ciclo di combustione dell'idrogeno e per la Nucleosintesi Primordiale. L'impatto dei risultati ottenuti è

molteplice: dalla fisica dei neutrini ai modelli stellari e alla cosmologia.

Nel 2019 verrà installato ai LNGS un nuovo acceleratore da 3.5 MV per studiare reazioni chiave dei cicli di combustione dell'elio e del carbonio (Progetto LUNA MV)

Nell'ambito della collaborazione LUNA ho rivestito e rivestirò i seguenti ruoli:

Principal Investigator del Progetto Premiale LUNA MV finanziato dal MIUR nel 2011 e nel 2012 per un totale di circa 5.3 milioni di euro.

Luglio 2009-Luglio 2015: Spokesperson della collaborazione e Responsabile Nazionale per l'INFN (6 anni sono il periodo massimo consentito dalle regole interne della collaborazione). Finanziamento gestito circa 300 keuro/anno

Da Luglio 2007: Responsabile Locale per la sede di Milano e membro del Collaboration Board. Finanziamento gestito circa 30 keuro/anno

Luglio 2007-Giugno 2009: coordinatore dell'Editorial Board

Da settembre 2015 a luglio 2018: Membro dell'Editorial Board

Da marzo 2018 coordinatore del progetto di ricerca 12C+12C

Da gennaio 2017 sono stata nominata dal MIUR membro del Management Committee per l'Italia della COST action: "ChETEC: Chemical Elements as Tracer of the Evolution of the Cosmos" [http://www.cost.eu/COST\\_Actions/ca/CA16117](http://www.cost.eu/COST_Actions/ca/CA16117). Nel corso del kick-off meeting della Action svoltosi ad aprile 2017 sono stata nominata Membro del Core group (Steering committee) e coordinatore del WG1 (Nuclear data for astrophysics: needs, coordination and dissemination)

In passato ho svolto ricerche nel campo della fisica nucleare. In particolare mi sono occupata di:

Radioattività esotica: fenomeno intermedio tra decadimento alfa e fissione spontanea che consiste nell'emissione spontanea di "cluster" come  $^{14}\text{C}$ ,  $^{24}\text{Ne}$ ,  $^{24}\text{Mg}$  ed altri ancora da nuclei nella regione dell'Uranio-Torio, caratterizzato da vite medie parziali estremamente lunghe e forte competizione con altre forme di decadimento adronico (alfa e fissione spontanea). Quest'attività, svolta da un numero molto ristretto di persone, è stata ampiamente riconosciuta a livello internazionale, come dimostrato dall'invito a scrivere i capitoli sulla "nuova forma di radioattività" nei volumi "Nuclear Decay Modes" ed "Heavy Elements and Related new Phenomena", un articolo divulgativo sulla rivista "Il Nuovo Saggiatore" ed un articolo su "Romanian report in Physics" oltre che dalle numerose presentazioni a congressi nazionali ed internazionali anche su invito, tra cui la Gordon Conference on Nuclear Chemistry del 1997.

Emissione di protoni beta ritardati e decadimento beta: Nel periodo marzo-agosto 1995 ho lavorato come post-doc presso il GSI (Darmstadt, Germania) nel gruppo del Prof. E. Roeckl, utilizzando un separatore di massa accoppiato ad un acceleratore lineare per studiare l'emissione di protoni beta ritardati da nuclei di interesse per il processo astrofisico rp (rapid proton capture) ed il decadimento beta da nuclei nella regione dello  $^{100}\text{Sn}$ . Nello stesso periodo sono stata "spokesperson" della proposta di esperimento per la misura dell'emissione di  $^{12}\text{C}$  da  $^{114}\text{Ba}$ , effettuato al GSI nel novembre 2006.

Radioattività protonica: emissione spontanea di protoni da nuclei poveri di neutroni e lontani dalla valle di stabilità. In particolare ho progettato l'apparato di rivelazione utilizzato presso il separatore di rinculo dei Laboratori Nazionali di Legnaro con il quale è stato possibile misurare per la prima volta l'emissione protonica da  $^{117}\text{La}$ .

Produzione di fasci radioattivi e misure di reazioni nucleari ("scattering" e "break-up") alla barriera coulombiana con fasci esotici: attività svolta nell'ambito della collaborazione EXOTIC (finanziata dalla commissione scientifica nazionale 3 dell'INFN) di cui sono stata responsabile locale per la sede di Milano dal 2003 al 2012 gestendo un finanziamento di circa 30 keuro/anno. La ricerca è stata svolta principalmente presso i Laboratori di Legnaro dove è stato installato un apparato volto alla produzione

di fasci radioattivi. Il confronto tra sezioni d'urto di "scattering" elastico e "break-up" ottenute con fasci radioattivi o stabili, a parità di bersaglio, fornisce importanti informazioni sul potenziale nucleare.

Parallelamente alle attività di ricerca sopra descritte mi sono occupata anche di fisica applicata. In particolare ho partecipato all'allestimento di un laboratorio per la datazione di campioni geologici ed archeologici di ossidiana con la tecnica delle tracce di fissione e ho partecipato alla messa a punto di un dosimetro basato su rivelatori a traccia per la misura di radon "indoor", utilizzato per la certificazione a norma di legge di edifici pubblici.

Sono stata responsabile del progetto PUR dell'Università di Milano per l'anno 2008 "Misura di gas radon in zone sismiche tramite spettrometria alfa" finanziato con 5 keuro.

Attività didattica:

Ho svolto quasi tutta la mia attività didattica presso l'Università degli Studi di Milano pertanto l'Ateneo di pertinenza viene indicato esplicitamente solo per le attività svolte in altri Atenei.

1) Attività didattica nel ruolo di Professore di Seconda Fascia

Da 2011/12 a 2018/19:

Radioattività (laurea magistrale in Fisica)

Laboratorio di Ottica, Elettronica e Fisica Moderna- modulo di ottica e fisica moderna (laurea triennale in Fisica)

Da 2012/13 a 2018/2019:

Fisica Generale 1 (laurea triennale in Matematica)

2) Attività didattica nel ruolo di ricercatore suddivisa per corsi

2001/02: Esercitazioni per il corso di Esperperimentazioni di Fisica II (laurea in Fisica)

Da 2003/04 a 2008/09: Laboratorio di Fisica 3 (laurea triennale in Fisica)

Da 2002/03 a 2008/09: Laboratorio di Fisica 4 (laurea triennale in Fisica)

2003/04 e 2004/05: Esercitazioni per il corso di Fisica 3 (laurea triennale in Fisica)

2009/10 e 2010/11: Laboratorio di Ottica, Elettronica e Fisica Moderna- modulo di ottica e fisica moderna (laurea triennale in Fisica)

2007/08 e 2008/09: Radioattività 1 (laurea magistrale in Fisica)

2009/10 e 2010/11: Radioattività (laurea magistrale in Fisica)

2009/10: Laboratorio di Misure Fisiche per l'ambiente – turno di Radioattività (laurea magistrale in Fisica)

1) Attività didattica precedente al ruolo di ricercatore suddivisa per corsi

1990/91, 1991/92 e 1992/93: Esercitazioni per il corso di Fisica Generale (Scienze Biologiche). Sede distaccata di Varese

1995/96, 1996/97, 1997/98 e 1998/99: Esercitazioni per il corso di Fisica Generale (Diploma in Tecnologie Farmaceutiche). Sede distaccata di Lodi

1996/97, 1997/98 e 1998/99: Esercitazioni per il corso di Fisica Generale (Diploma in Chimica Tessile). Università dell'Insubria, sede di Como

2000/01: Esercitazioni per il corso di Esperperimentazioni di Fisica II (laurea in Fisica)

Tesi di laurea:

Relatrice di 21 tesi di laurea in fisica (1 ciclo unico, 6 magistrali, 14 triennali)  
Correlatrice di 7 tesi di laurea in fisica (6 ciclo unico, 1 triennale)

Tra gli studenti di cui sono stata relatrice/correlatrice:

Gianluca Poli riveste il ruolo di funzionario internazionale in qualita' di fisico medico presso la IAEA di Vienna

Chiara Mazzocchi è assistant professor (Dr. Hab) presso l'Università di Varsavia

Carlo Bruno si è classificato secondo su 310 partecipanti al concorso per borse di dottorato di ricerca in UK finanziate dalla Scottish Universities Physics Alliance (SUPA). Attualmente è post-doc ad Edimburgo

Altri 6 studenti hanno svolto o stanno svolgendo il Dottorato di ricerca in Italia o all'estero

Assegni di ricerca:

Docente responsabile di 2 assegni di ricerca rettorali UNIMI e di 1 assegno di ricerca INFN

Dottorato di ricerca:

Supervisor di Eliana Masha (dottorato di ricerca in fisica astrofisica e fisica applicata - Università degli Studi di Milano ciclo XXXIV, inizio a.a. 2018/2019)

Per un maggior dettaglio si veda l'elenco allegato

## ULTERIORI INFORMAZIONI

Pubblicazioni  
Presentazioni a Conferenze  
Seminari  
Ruoli rivestiti in conferenze internazionali e workshops

Pubblicazioni:  
Sono autrice o coautrice di 205 pubblicazioni:  
102 pubblicazioni su riviste internazionali, molte delle quali ad elevato impact factor  
93 proceedings di conferenze internazionali, la maggior parte pubblicati in seguito a valutazione anonima tra pari e su riviste con impact factor  
2 capitoli di libri  
8 pubblicazioni su invito  
14 pubblicazioni a firma singola e 11 a due autori. Si veda l'elenco allegato per un maggior dettaglio.

Co-editor di "Topical issue on underground nuclear astrophysics and solar neutrinos: Impact on astrophysics, solar and neutrino physics"  
European Physical Journal - Topical Issue 52 (2016)

Impatto globale:  
Fonte Web of Science- ottobre 2018:  
H index = 31; numero citazioni totali 3351  
Fonte Scopus- ottobre 2018:  
H index = 31; numero citazioni totali 3799

Orcid: <http://orcid.org/0000-0002-6008-1629>

Presentazioni orali a conferenze internazionali e nazionali e seminari:  
28 presentazioni orali su invito a conferenze internazionali  
5 presentazioni orali su invito a conferenze nazionali  
7 presentazioni orali a conferenze internazionali  
3 presentazioni orali a conferenze nazionali  
15 seminari su invito

Tra le presentazioni orali su invito si citano:  
"Gordon Conference on nuclear chemistry", New London 1997  
"International conference Nuclear Physics in Astrophysics IV", Frascati 2009  
"INPC: International Nuclear Physics Conference 2013", Firenze 2013

"TAUP: Topics in Astroparticle and Underground Physics 2013", Asilomar (CA, USA) 2013

Tra i seminari su invito si citano i Physics Colloquia presso Oak Ridge National Laboratory (2008) e Max Plank Institute Munich (2016)

Da ottobre 2009 a giugno 2015 due presentazioni annuali al Comitato Scientifico dei Laboratori Nazionali del Gran Sasso e una/due presentazioni annuali alla commissione scientifica nazionale 3 dell'INFN per l'esperimento LUNA.

Si veda l'elenco allegato per un maggior dettaglio

Ruoli rivestiti in conferenze internazionali e workshops:

Membro dell'International Advisory Committee (IAC) for the Nuclear Structure and Dynamics conference 2019

Membro dell'International Advisory Committee (IAC) for the 2019 International Nuclear Physics Conference (INPC2019)

Membro del "International Advisory Committee" per la "15th edition of the Varenna Conference on Nuclear Reaction Mechanisms" 2018

Membro dell'International Advisory Committee (IAC) per la conferenza "15th International Symposium on Nuclei in the Cosmos" 2018

Membro del "International Advisory Board (IAB)" per la conferenza Nuclear Physics in Astrophysics 2015

Membro dell' "International Advisory committee (IAC)" della conferenza Origin of Matter and Evolution of Galaxies (OMEG2015)

Membro del comitato promotore dell'"Incontro Nazionale di Fisica Nucleare", Catania 2012 Padova 2014 e Frascati 2016

Membro del "International Program Committee (IPC)" per la conferenza Nuclear Physics in Astrophysics 2013

Chair del Workshop: "On underground accelerator LUNA MV" 2011

Chair del Workshop: "Starting-up the LUNA-MV collaboration" 2013

Membro del Comitato Organizzatore del "Nuclear Astrophysics at the Canfranc Underground Laboratory- 2nd CUNA Workshop", Canfranc 2016

Membro del comitato organizzatore del Workshop "Silver moon: the first and the next 25 years of nuclear astrophysics at Gran Sasso", LNGS 2016

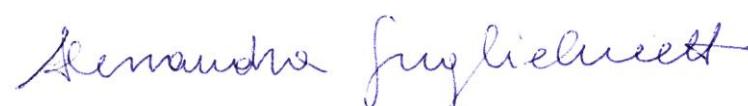
Membro del comitato organizzatore locale della conferenza "On nuclear Reaction mechanism" Varenna 2009; Varenna 2012; Varenna 2015

## ALLEGATI

- Elenco pubblicazioni
- Attività didattiche
- Elenco presentazioni a conferenze

### Dati personali

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 (Codice in materia di protezione dei dati personali) e sue successive modifiche e integrazioni, nonché del Regolamento UE 679/2016 (Regolamento Generale sulla Protezione dei dati o, più brevemente, RGPD).



Milano, 26/02/2019

# Alessandra Guglielmetti

## Elenco delle pubblicazioni:

Lavori pubblicati su riviste internazionali:

- 1) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino  
"Calibration of BP-1 phosphate glass with heavy ion beams"  
Nuclear Tracks Radiation Measurements **18** (1991), 325
- 2) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino  
"Energy response of LR-115 cellulose nitrate to  $\alpha$  particles beams"  
Nuclear Tracks Radiation Measurements **18** (1991), 312
- 3) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino, A. Cesana, M. Terrani  
"Measurements of exotic decay half-lives with track detectors"  
Nuclear Tracks Radiation Measurements **19** (1991), 579
- 4) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino, A. Cesana, M. Terrani, P. B. Price  
"Neon radioactivity of uranium isotopes"  
Phys. Rev. C **44** (1991), 888
- 5) P. B. Price, R. Bonetti, A. Guglielmetti, C. Chiesa, R. Matheoud, C. Migliorino, K. J. Moody  
"Emission of  $^{23}\text{F}$  and  $^{24}\text{Ne}$  in cluster radioactivity of  $^{231}\text{Pa}$ "  
Phys. Rev. C **46** (1992), 1939
- 6) R. Bonetti, L. Capra, C. Chiesa, C. Dezzuto, U. Facchini, A. Guglielmetti, D. Lainati, A. Parravicini, M. T. Trabucchi  
"Radon indoor measurements: results from sites in the Italian Prealps"  
Radiation Protection Dosimetry **45** (1992), 473
- 7) R. Bonetti, C. Chiesa, A. Guglielmetti, R. Matheoud, C. Migliorino, A. L. Pasinetti, H. L. Ravn  
"Nuclear structure effects in the exotic decay of  $^{225}\text{Ac}$  via  $^{14}\text{C}$  emission"  
Nucl. Phys. A **562** (1993), 32
- 8) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino, A. Cesana, M. Terrani  
"Discovery of oxygen radioactivity of atomic nuclei"  
Nucl. Phys. A **556** (1993), 115
- 9) R. Bonetti, A. Guglielmetti  
"Experiments on cluster radioactivity"  
Romanian Journal of Physics **38** (1993), 339
- 10) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino, P. Monti  
"Spontaneous emission of  $^{14}\text{C}$  clusters from A=221 nuclei"  
Z. Phys. A **349** (1994), 309
- 11) R. Bonetti, C. Chiesa, A. Guglielmetti, C. Migliorino, P. Monti, A. L. Pasinetti, H. L. Ravn  
"Carbon radioactivity of  $^{221}\text{Fr}$  and  $^{221}\text{Ra}$  and the hindered decay of exotic odd-A emitters"  
Nucl. Phys. A **576** (1994), 21
- 12) A. Guglielmetti, B. Blank, R. Bonetti, Z. Janas, H. Keller, R. Kirchner, O. Klepper, A. Piechaczek, A. Plochocki, G. Poli, P. B. Price, E. Roeckl, K. Schmidt, J. Szerypo, A. J. Westphal  
"Production of  $^{114}\text{Ba}$  in  $^{58}\text{Ni} + ^{58}\text{Ni}$  reactions and detection of its cluster radioactivity"  
Nucl. Phys. A **583** (1995), 867
- 13) A. Guglielmetti, B. Blank, R. Bonetti, Z. Janas, H. Keller, R. Kirchner, O. Klepper, A. Piechaczek, A. Plochocki, G. Poli, P. B. Price, E. Roeckl, K. Schmidt, J. Szerypo, A. J. Westphal

- "Identification of the new isotope  $^{114}\text{Ba}$  and search for its alpha and cluster radioactivity"  
Phys. Rev. C **52** (1995), 740
- 14) R. Bonetti, C. Chiesa, A. Guglielmetti, R. Matheoud, G. Poli, V. L. Mikheev, S. P. Tretyakova  
"First observation of spontaneous fission and search for cluster decay of  $^{232}\text{Th}$ "  
Phys. Rev. C **51** (1995), 2530
- 15) M. Hussonnois, J. F. Le Du, D. Trubert, R. Bonetti, A. Guglielmetti, T. Guzel, S. P. Tretyakova, V. L. Mikheev, A. N. Golovchenko, V. A. Ponomarenko  
"Cluster decay of  $^{236}\text{Pu}$  and correlations of the probabilities of  $\alpha$  decay, cluster decay, and spontaneous fission of heavy nuclei"  
JETP Lett **62** (1995), 701
- 16) A. C. Merchant, A. Guglielmetti  
"Alpha and exotic decays to  $^{210}\text{Pb}$  daughter states"  
Nucl Phys A **600** (1996), 403
- 17) R. Bonetti, A. Guglielmetti, C. Chiesa, R. Matheoud, G. Poli, V. L. Mikheev, S. P. Tretyakova  
"Cluster decay and spontaneous fission of  $^{232}\text{Th}$ "  
Physics of Atomic Nuclei **59** (1996), 43
- 18) M. Hellström, Z. Hu, A. Weber, M. Hencheck, M. J. Balbes, R. N. Boyd, D. Cano-Ott, R. Collatz, A. Guglielmetti, Z. Janas, M. Karny, R. Kirchner, J. Morford, D. J. Morrisey, G. Raimann, E. Roeckl, K. Schmidt, J. Szerypo  
"Beta-delayed proton emission around N=50 and the rp-process"  
Z. Phys A **356** (1996), 229
- 19) S. P. Tretiakova, R. Bonetti, A. Guglielmetti, V. L. Mikheev, A. A. Ogloblin, D. Trubert, I. K. Shvetsov, M. Hussonnois  
"Cluster radioactivity of  $^{232}\text{Th}$ ,  $^{230}\text{U}$ ,  $^{236}\text{Pu}$ , and  $^{242}\text{Cm}$  nuclei"  
Bull. Russ. Acad. Sci., Phys. **60** (1996), 87
- 20) R. Bonetti, A. Guglielmetti, G. Poli  
"Calibration of LG750 phosphate glass with heavy-ion beams"  
Radiation Measurements **27** (1997), 71
- 21) R. Bonetti, A. Guglielmetti, G. Poli  
"The  $^{11}\text{B}(\alpha, p)$  reaction and its relevance in subsurface  $^{14}\text{C}$  production"  
Appl. Radiat. Isot. **48** (1997), 873
- 22) G. Raimann, M. J. Balbes, R. N. Boyd, D. Cano-Ott, R. Collatz, A. Guglielmetti, M. Hellström, M. Hencheck, Z. Hu, Z. Janas, M. Karny, R. Kirchner, J. Morford, D. J. Morrisey, E. Roeckl, K. Schmidt, J. Szerypo, A. Weber  
"The rp-process and new measurements of  $\beta$ -delayed proton decay of light Ag and Cd isotopes"  
Nucl. Phys. A **621** (1997), 215c
- 23) A. Guglielmetti, R. Bonetti, G. Poli, R. Collatz, Z. Hu, R. Kirchner, E. Roeckl, N. Gunn, P. B. Price, B. A. Weaver, A. Westphal, J. Szerypo  
"Nonobservation of  $^{12}\text{C}$  cluster decay of  $^{114}\text{Ba}$ "  
Phys. Rev. C **56** (1997), R2912
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89) M. Mazzocco, A. Boiano, C. Boiano, M. La Commara, C. Manea, C. Parascandolo, D. Pierroutsakou, C. Signorini, E. Strano, D. Torresi, H. Yamaguchi, D. Kahl, L. Acosta, P. Di Meo, J.P. Fernandez-Garcia, T. Glodariu, J. Grebosz, A. Guglielmetti, N. Imai, Y. Hirayama, H. Ishiyama, N. Iwasa, S.C. Jeong, H.M. Jia, N. Keeley, Y.H. Kim, S. Kimura, S. Kubono, J.A. Lay, C.J. Lin, G. Marquinez-Duran, I. Martel, H. Miyatake, M. Mukai, T. Nakao, M. Nicoletto, A. Pakou, K. Rusek, Y. Sakaguchi, A.M. Sánchez-Benítez, T. Sava, O. Sgouros, C. Stefanini, F. Soramel, V. Soukeras, E. Stiliaris, L. Stroe, T.

Teranishi, N. Toniolo, Y. Wakabayashi, Y.X. Watanabe, L. Yang, Y.Y. Yang  
7Be-and 8B-reaction dynamics at Coulomb barrier energies  
EPJ Web of conference 117 (2016) 06006

90) D. Torresi, E. Strano, M. Mazzocco, A. Boiano, C. Boiano, P. Di Meo, M. La Commara, C. Manea, M. Nicoletto, J. Grebosz, A. Guglielmetti, P. Molini, C. Parascandolo, D. Pierroutsakou, C. Signorini, F. Soramel, N. Toniolo, D. Filipescu, A. Gheorghe, T. Glodariu, S. Jeong, Y.H. Kim, J.A. Lay, H. Miyatake, A. Pakou, O. Sgouros, V. Soukeras, L. Stroe, A. Vitturi, Y. Watanabe, K. Zerva  
Elastic scattering of  $^{170}$ O+ $^{208}$ Pb at energies near the Coulomb barrier  
EPJ Web of conference 117 (2016) 08027

91) C. Parascandolo, D. Pierroutsakou, R. Alba, A. Del Zoppo, C. Maiolino, D. Santonocito, C. Agodi, V. Baran, A. Boiano, M. Colonna, R. Coniglione, E. De Filippo, M. Di Toro, U. Emanuele, F. Farinon, A. Guglielmetti, M. La Commara, B. Martin, C. Mazzocchi, M. Mazzocco, C. Rizzo, M. Romoli, C. Signorini, R. Silvestri, F. Soramel, E. Strano, D. Torresi, A. Trifirò, M. Trimarchi  
Dynamical Dipole mode in the  $^{40,48}$ Ca + $^{152,144}$ Sm fusion reactions at 11 MeV/nucleon  
EPJ Web of conference 117 (2016) 08016

92) G. Gervino, C. Gustavino, D. Trezzi, M. Aliotta, M. Anders, A. Boeltzig, D. Bemmerer, A. Best, C. Broggini, C. Bruno, A. Caciolli, F. Cavanna, P. Corvisiero, T. Davinson, R. Depalo, A. Dileva, Z. Elekes, F. Ferraro, A. Formicola, Z. Fülöp, A. Guglielmetti, G. Gyürky, G. Imbriani, M. Junker, R. Menegazzo, P. Prati, D.A. Scott, O. Straniero, T. Szücs  
Ultra-sensitive  $\gamma$ -ray spectroscopy set-up for investigating primordial lithium problem  
Nucl. Instr. and Meth. A 824 (2016) 617

93) Alessandra Guglielmetti  
"Nuclear Astrophysics and LUNA MV"  
PoS (Neutel2017) 025, 2018

#### Capitoli di libri

- 1) R. Bonetti, A. Guglielmetti  
"Experiments on heavy cluster (O, F, Ne, Mg, Si) radioactivities"  
in "Nuclear decay modes" edited by D. N. Poenaru  
IOP, Bristol, 1996
- 2) R. Bonetti, A. Guglielmetti  
"Measurements on cluster radioactivity-present experimental status"  
in "Heavy Elements and Related New Phenomena" edited by W. Greiner and Raj K. Gupta  
World Scientific, Singapore, 1999

#### Pubblicazioni su invito

- 1) R. Bonetti, L. Bongiorno, A. Guglielmetti  
"L'uso delle tracce di fossili di fissione nella datazione di ossidiane"  
in "Rendiconti dell'Istituto Lombardo Accademia di Scienze e Lettere"  
Milano, 1995
- 2) R. Bonetti, A. Guglielmetti  
"Esperimenti di radioattività esotica"  
Il Nuovo Saggiatore, 16 (2000), 29

- 3) A. Guglielmetti  
"Risultati recenti su misure di reazioni nucleari di interesse astrofisico"  
in "Rendiconti dell'Istituto Lombardo Accademia di Scienze e Lettere"  
Milano, 2005

- 4) R. Bonetti, A. Guglielmetti  
"Cluster radioactivity: an overview after 20 years"  
Romanian Reports in Physics 59 (2007), 301

5) C. Broggini, D. Bemmerer, A. Guglielmetti, R. Menegazzo

“LUNA: nuclear astrophysics deep underground”

Ann. Rev Nucl. Part Sci 60 (2010), 53

6) L. Gialanella, A. Guglielmetti

“Direct measurement in nuclear astrophysics: ERNA and LUNA”

Scholarpedia 8(5) (2013) 11959

7) A. Guglielmetti

The LUNA-MV Project at Gran Sasso Underground Laboratory

Nuclear Physics News 24:1 (2014), 40

8) G. Bellini, C. Broggini, and A. Guglielmetti

Topical issue on underground nuclear astrophysics and solar neutrinos: Impact on astrophysics, solar and neutrino physics

European Physical Journal - Topical Issue 52 (2016) 88

Data

26/02/2019

Luogo

Milano



# Alessandra Guglielmetti

## Attività didattica:

### 1) Attività precedente al ruolo di ricercatore suddivisa per corsi

Anni accademici 1990/91, 1991/92 e 1992/93:

Esercitazioni per il corso di **Fisica Generale** a Scienze Biologiche presso l'Università degli Studi di Milano (sede distaccata di Varese)

Anni accademici 1995/96, 1996/97, 1997/98 e 1998/99

Esercitazioni per il corso di **Fisica Generale** al Diploma in Tecnologie Farmaceutiche presso l'Università degli Studi di Milano (sede di Lodi)

Anni accademici 1996/97, 1997/98 e 1998/99

Esercitazioni per il corso di **Fisica Generale** al Diploma in Chimica Tessile presso l'Università dell'Insubria (sede di Como)

Anno accademico 2000/01

Esercitazioni per il corso di **Esperimentazioni di Fisica II** a Fisica presso l'Università degli Studi di Milano

### 2) Compiti didattici di ricercatore suddivisi per corsi

Anno accademico 2001/02

Esercitazioni per il corso di **Esperimentazioni di Fisica II** a Fisica presso l'Università degli Studi di Milano

Anni accademici 2002/03, 2003/04 e 2004/2005

Esercitazioni per il corso di **Laboratorio di Fisica 3** a Fisica presso l'Università degli Studi di Milano

Anni accademici 2002/03 e 2003/04

Esercitazioni per il corso di **Laboratorio di Fisica 4** a Fisica presso l'Università degli Studi di Milano

Anni accademici 2003/04 e 2004/05

Esercitazioni per il corso di **Fisica 3** a Fisica presso l'Università degli Studi di Milano

Anno accademico 2010/2011

Esercitazioni per il corso di **Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)** presso l'Università degli Studi di Milano

### 3) Affidamenti della Facoltà di Scienze Matematiche Fisiche e Naturali dell'Università degli Studi di Milano divisi per corsi

Anni accademici 2004/2005, 2005/2006, 2006/2007, 2007/2008 e 2008/2009

**Laboratorio di Fisica 4** (laurea triennale in Fisica)

Anni accademici 2005/2006, 2006/2007 e 2007/2008

**Laboratorio di Fisica 3** (laurea triennale in Fisica)

Anno accademico 2007/2008 **Radioattività 1** (laurea magistrale in Fisica)

### 4) Assegnazioni dirette ("professore aggregato")

Anno accademico 2008/2009

**Laboratorio di Fisica 3, Radioattività 1, Laboratorio di Misure Fisiche per l'ambiente – turno di Radioattività**

Anno accademico 2009/2010

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna), Radioattività, Laboratorio di Misure Fisiche per l'ambiente – turno di Radioattività**

Anno accademico 2010/2011

**Radioattività**

**5) Compiti didattici (Professore di Seconda Fascia)**

Anno accademico 2011/2012

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

Anno accademico 2012/2013

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2013/2014

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2014/2015

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2015/2016

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2016/2017

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2017/2018

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

Anno accademico 2018/2019

**Radioattività**

**Laboratorio di Ottica, Elettronica e Fisica Moderna (modulo di ottica e fisica moderna)**

**Fisica Generale 1 per il corso di laurea triennale in Matematica**

**5) Tesi di laurea:****Correlatrice**

- G. Poli (quadriennale), "Studio sperimentale di fissione spontanea ed emissione esotica con la tecnica dei rivelatori a traccia", 1993/94
- C. Mazzocchi (quadriennale), "Il decadimento esotico del  $^{242}\text{Cm}$  per emissione di cluster di silicio", 1997/98
- C. Carbonini (quadriennale), "Misure di decadimenti adronici rari di diversi isotopi dell'Uranio", 1999/00
- M. Gernetti (quadriennale), "Radioattività protonica del nucleo deformato  $^{125}\text{Pm}$ ", 2001/02
- A. Manzoni (quadriennale), "Il metodo delle tracce di fissione nella datazione di campioni geologici ed archeologici", 2001/02
- J. Spinoni (triennale) "Datazione di ossidiane col metodo delle tracce di fissione", 2004/05
- D. Faccio (quadriennale), "Misura del rapporto di branching tra decadimento esotico ed alfa del nucleo  $^{223}\text{Ac}$ ", 2005/2006

**Relatrice**

- E. Predolini (quadriennale): "Studio del decadimento esotico del nucleo  $^{223}\text{Ac}$ ", 2004/2005
- T. Santaniello (triennale) "Misura del decadimento esotico del  $^{223}\text{Ac}$ ", 2006/2007
- V. Capogrosso (magistrale) "Misura della sezione d'urto della reazione  $^{15}\text{N}(\text{p},\gamma)^{16}\text{O}$  ad energie di interesse astrofisico", 2008/2009
- M. Motta (triennale) "Studio di bersagli solidi di  $^{18}\text{O}$  per la misura della reazione  $^{17}\text{O}(\text{p},\gamma)^{18}\text{F}$  nell'ambito dell'esperimento LUNA", 2009/2010
- C. Bruno (triennale) "Studio di fattibilità della reazione  $d(\alpha,\gamma)^6\text{Li}$  nell'ambito dell'esperimento LUNA", 2009/2010
- L. Di Pietro (triennale) "Datazione di campioni di ossidiana con il metodo delle tracce di fissione", 2009/2010
- D. Nicola (triennale) "Ultimi risultati sulle sezioni d'urto delle reazioni di fusione termonucleare di interesse per il sole" 2010/2011
- M. Campeggio (magistrale) "Misura delle reazioni  $^{17}\text{O}(\text{p},\gamma)^{18}\text{F}$  e  $^{18}\text{O}(\text{p},\gamma)^{19}\text{F}$  nell'ambito dell'esperimento LUNA", 2010/2011
- C. Bruno (magistrale) "Misura della reazione  $^{17}\text{O}(\text{p},\alpha)^{14}\text{N}$  nell'ambito dell'esperimento LUNA", 2011/2012
- G. Lerner (triennale) "Studio del fondo di un rivelatore al germanio per misure di sezioni d'urto di reazioni nucleari di interesse astrofisico", anno 2011/2012

- F. Tresoldi (triennale) "Misure ancillari per lo studio della reazione  $^{17}\text{O}(\text{p},\alpha)^{14}\text{N}$  a LUNA, anno 2011/2012
- E. Ragusa (triennale) "Studio della reazione  $^{12}\text{C}(\alpha,\gamma)^{16}\text{O}$  ad energie di interesse astrofisico", anno 2011/2012
- A. Artesani (magistrale) "Surface dating: una nuova tecnica di datazione di manufatti in laterizi e in pietra", anno 2012/2013
- G. Porzio (triennale) "Studio dell'effetto di beam-heating per la misura della reazione di interesse astrofisico  $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ , anno 2013/2014
- A. Ferrari (triennale) "Analisi dei risultati ottenuti dalla misura della sezione d'urto della reazione  $2\text{H}(\text{p},\gamma)3\text{He}$  effettuata a LUNA"
- E. Masha (triennale indirizzo applicativo) "Sviluppo della schermatura da neutroni per l'acceleratore LUNA MV" anno 2014/2015
- Cinzia Braglia (triennale)"Studio preliminare della reazione  $2\text{H}(\text{p},\text{g})3\text{He}$  ad energie di interesse per la nucleosintesi primordiale a LUNA" anno 2015/2016
- Annachiara Filippini (triennale) "Analisi di bersagli di Litio per misure di sezioni d'urto di reazioni nucleari di interesse astrofisico" anno 2016/2017
- Guido Zorzi (magistrale) "Misura della reazione  $2\text{H}(\text{p},\text{g})3\text{He}$  a LUNA" 2016/2017
- Eliana Masha (magistrale) "Studio dell'abbondanza di deuterio primordiale" 2016/2017
- Stefano Dibartolomeo (triennale) "Studio della reazione  $2\text{H}(\text{p},\text{g})3\text{He}$ " 2017/2018

**6) assegni di ricerca**

Docente responsabile dell'assegnista di ricerca UNIMI dott.ssa Chiara Mazzocchi da luglio 2007 a ottobre 2010

Docente responsabile dell'assegnista di ricerca INFN dott. Davide Trezzi da gennaio 2011

Docente responsabile dell'assegnista di ricerca UNIMI dott. Davide Trezzi da aprile 2013 a gennaio 2017

**7) Dottorato di ricerca**

Supervisor di Eliana Masha (dottorato di ricerca in fisica astrofisica e fisica applicata - Università degli Studi di Milano ciclo XXXIV, inizio a.a. 2018/2019)

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# Alessandra Guglielmetti

## Presentazioni su invito a conferenze internazionali e nazionali

- "On atomic and nuclear physics topics", Predeal 1992
- "Cluster 94", Strasburgo 1994
- "International workshop on new ideas on clustering in nuclear and atomic physics", Rauschholzhausen Castle 1997
- "Gordon Conference on nuclear chemistry", New London 1997
- "Workshop on Nuclear Reactions in stars and in the laboratory", Trento 1999
- "Exotic Nuclei at the proton drip-line", Camerino 2001
- "Exotic Clustering", Catania 2002
- "International conference Nuclear Physics in Astrophysics IV", Frascati 2009
- "GIANTS 2010", Catania 2010
- "Underground nuclear-reaction experiments for astrophysics and applications", Dresden 2010
- "From the Big bang to the nucleosynthesis", Varenna 2010
- "8th Russbach workshop on nuclear astrophysics", Russbach 2011
- "Fusion 11" St. Malo' 2011
- "VI European Summer School on Experimental Nuclear Astrophysics", Santa Tecla 2011
- "Critical stability", Erice 2011
- "Workshop on Thermonuclear Reaction Rates for Astrophysics Applications", Athens 2011
- "Nuclear Astrophysics at the Canfranc Underground Laboratory", Canfranc 2012
- "Electro-Weak Probes: from Low-Energy Nuclear Physics to Astrophysics" Trento 2012
- "7<sup>th</sup> Italy- Japan Symposium on Nuclear Physics" Milano 2012
- "2<sup>nd</sup> NEDENSA NuPNET project meeting" Acireale 2013
- "INPC: International Nuclear Physics Conference 2013", Firenze 2013
- "TAUP: Topics in Astroparticle and Underground Physics 2013", Asilomar (CA, USA) 2013
- "Direct Measurements in Nuclear Astrophysics with Recoil Mass Separators", Caserta 2013
- "Wigner 111 - Colourful & Deep", Budapest 2013
- "GIANTS 2015", Padova 2015
- "Nuclear Structure and Dynamics", Portorose 2015
- "SIF 2015", Roma 2015
- "Lia CollAGAIN, POLITA e COPIGAL workshop", Catania 2016
- XVII international workshop on Neutrino Telescopes, Venezia 2017
- "Ages^2 taking stellar ages to the next power", Isola d'Elba 2017
- "SIF 2017", Trento 2017
- "Solar neutrino conference", Dresden 2018
- "SIF 2018", Rende 2018 (relazione generale)

## Seminari su invito

- Universita' di Catania 1993: "Esperimenti di radioattività esotica: lo stato dell'arte"
- Universita' di Mainz 1995: "Cluster radioactivity: the experimental status of the art"
- Riunione di lavoro sull'astrofisica nucleare, Napoli 1999 "Possible use of CR39 track detectors for measuring the  ${}^7\text{Be}(\text{p}, \gamma){}^8\text{B}$  reaction at LUNA"
- Istituto Lombardo-accademia di scienze e lettere, Milano 2004, "Risultati recenti su misure di reazioni nucleari di interesse astrofisico"
- "Gran Sasso day", Milano 2007, "Un laboratorio sotterraneo per studiare le stelle: esperimento LUNA"
- Oak Ridge National Laboratory 2008, "Physics colloquium", "The LUNA experiment at Gran Sasso, Italy"
- Nupecc meeting, Catania 2010, "LUNA at LNGS"
- LNGS 2010 "The  ${}^2\text{H}(\alpha, \gamma){}^6\text{Li}$  reaction measurement at LUNA"
- CEN Bordeaux 2011 "Cluster radioactivity: the experimental status of the art"
- CPPM Marseille 2012 "The LUNA experiment studying stars by going underground"
- Notre Dame University 2013 "Measuring stars by going underground: the LUNA experiment at Gran Sasso Laboratory"
- Institute for nuclear and particle physics, University of Edinburgh 2014 "The LUNA experiment at Gran Sasso Laboratory: studying stars by going underground"
- Università di Bari 2014 "L'esperimento LUNA ai Laboratori del Gran Sasso: studiare le stelle da sotto una montagna"
- Warsaw University 2015 "The LUNA experiment at Gran Sasso Laboratory: studying stars by going underground"

- Physics Colloquium: Max Plank Institute Munich 2016 "The LUNA experiment at Gran Sasso Laboratory: studying stars by going underground"

Da ottobre 2009 a giugno 2015 due presentazioni annuali al Comitato Scientifico dei Laboratori Nazionali del Gran Sasso e una/due presentazioni annuali alla commissione scientifica 3 dell'INFN per esperimento LUNA

### Presentazioni orali a conferenze internazionali

- "NFFS+AMCO", Bernkastel-Kues 1992
- "Cluster 93", Santorini 1993
- "On nuclear reaction mechanism", Varenna 1994
- "Enam 95", Arles 1995
- "Highlights in Physics", Milano 2005
- "Cluster 07", Stratford upon Avon 2007
- "Enam08", Ryn 2008

### Presentazioni orali a conferenze nazionali

- SIF, Udine 1993
- SIF, Catania 2005
- SIF, Napoli 2012

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## **Curriculum del Dott. Tommaso Lari**

### **Titoli accademici, contratti e attività professionale**

- Laurea in Fisica presso l'Università di Bologna il 12/06/1998 con la votazione di 110/110 e lode.
- Borsa di studio dell'INFN presso i Laboratori Nazionali del Gran Sasso, (Aprile 1998 - Marzo 1999).
- Dottorato di Ricerca presso l'Università di Milano (Marzo 1999 - Dicembre 2001) e conseguimento del titolo di Dottore di Ricerca in Fisica.
- Borsa di studio post-dottorato presso l'Università di Bonn (Germania) (Gennaio-Agosto 2002)
- Assegno di Ricerca dell'INFN presso la sezione di Milano (Marzo 2002 - Dicembre 2005).
- Ricercatore di III livello dell'INFN presso la sezione di Milano (tempo determinato : Dicembre 2005 - Maggio 2009; a tempo indeterminato dal Maggio 2009)
- Borsa di similfellow per svolgere attività di ricerca al CERN : Settembre 2008 - Agosto 2009 e Gennaio-Dicembre 2013)

### **Partecipazione a progetti di ricerca internazionali**

- ATLAS, esperimento del CERN per lo studio della rottura della simmetria elettrodebole e della fisica alla scala del TeV, dal 1999 alla data presente.
- MACRO, rivelatore per lo studio della radiazione cosmica e ricerca di monopoli magnetici ai LNGS, dal 1997 al 1999
- RD50, progetto del CERN per lo sviluppo di rivelatori resistenti alla radiazione, dal 2002 al 2004

## Ruoli e responsabilità di coordinamento

A meno che non sia diversamente specificato, tutti i ruoli riportati sono stati svolti insieme ad un collega, secondo lo standard diffuso nell'esperimento ATLAS di avere due coordinatori per ogni gruppo di lavoro.

- Convener del gruppo di **Supersimmetria** di ATLAS (Ottobre 2014 - Settembre 2016). Ruolo : coordinamento del lavoro di circa 300 ricercatori e studenti per analisi di ricerca di segnali supersimmetrici.
- Convener del gruppo di **Supersimmetria background forum** di ATLAS (Ottobre 2009 - Settembre 2010). Sottogruppo di Supersimmetria. Responsabilità : messa a punto e scrutinio delle procedure di stima dei fondi e della produzione MonteCarlo per le analisi del gruppo di Supersimmetria.
- Convener del gruppo di **Supersimmetria third generation squarks** di ATLAS (2011 - 2013). Sottogruppo di Supersimmetria, circa 60 ricercatori e studenti attivi.
- Convener del gruppo di **Supersimmetria electroweak production** di ATLAS (Aprile 2017 - Marzo 2018). Sottogruppo di Supersimmetria, circa 60 ricercatori e studenti attivi.
- Convener del gruppo di **Fast Chain** di ATLAS (Dicembre 2016 - presente). Responsabilità : sviluppo del futuro programma di simulazione dell'esperimento, con l'obiettivo di ridurre il consumo di CPU per evento di circa un fattore cento.
- Coordinamento delle **analisi di ATLAS Italia** (Ottobre 2016 - Settembre 2018, il primo anno come deputy ed il secondo come coordinatore principale). Fino a Settembre 2017, il ruolo prevedeva anche il coordinamento delle **iniziativa di terza missione di ATLAS Italia**.

## Incarichi istituzionali

- Da Gennaio 2017 sono membro della commissione assegni di ricerca della Sezione INFN di Milano.
- A partire dall’anno accademico 2014-2015 alla data presente, sono membro del Collegio dei Docenti del corso di Dottorato in Fisica dell’Università di Milano.

## Organizzazione di conferenze

### Conferenze e congressi internazionali :

- Convener del gruppo *New Physics of Electroweak Symmetry Breaking* del workshop *Physics at TeV Colliders* (Les Houches, 2005)<sup>1 2</sup>.
- Convener del gruppo di lavoro *Flavour Physics at high Q* del workshop *Flavour physics in the era of the LHC* (CERN, 2005-2007)<sup>3 4</sup>.
- Convener delle sessioni “SUSY” di *LHCP 2015* (Saint Petersburg, 2015)<sup>5</sup>.
- Convener delle sessioni “Search for supersymmetry” di *LHCP 2016* (Lund, 2016)<sup>6</sup>.
- Convener delle sessioni “Searches” di *LHCP 2017* (Shanghai, 2017)<sup>7</sup>.

### Conferenze e congressi nazionali :

- Chair della sessione parallela di *Nuova Fisica* agli *Incontri di Fisica delle Alte Energie* (Napoli, 2007)<sup>8</sup>.
- Convener della sessione *SUSY+Exotica* agli *Incontri di Fisica delle Alte Energie* (Cagliari, 2013)<sup>9</sup>.

<sup>1</sup>Web page : <https://phystev.cnrs.fr/Houches2005/>

<sup>2</sup>Proceedings : <https://arxiv.org/pdf/hep-ph/0602198.pdf>

<sup>3</sup>Web page : <http://mlm.home.cern.ch/mlm/FlavLHC.html>

<sup>4</sup>Proceedings : T. Lari et al., Eur. Phys. J. C57, 183, DOI <https://doi.org.ezproxy.cern.ch/10.1140/epjc/s10052-008-0713-4>

<sup>5</sup>Web page : <https://indico.cern.ch/event/389531/sessions/78346/>

<sup>6</sup>Web page : <https://indico.cern.ch/event/442390/page/5281/scientific-programme-overview>

<sup>7</sup>Web page : <https://indico.cern.ch/event/517784/sessions/223842/>

<sup>8</sup>Web page : <https://indico.cern.ch/event/14815/>

<sup>9</sup>Web page : <https://agenda.infn.it/conferenceTimeTable.py?confId=5829>

- Come vicecoordinatore (2016-2017) e coordinatore (2017-2018) delle analisi di ATLAS Italia, ho selezionato le presentazioni e i poster sottomessi da ATLAS a IFAE 2017 e IFAE 2018, e ai congressi della Società Italiana di Fisica del 2017 e 2018. Ho poi revisionato i contributi accettati e (nel caso di IFAE) i proceedings.

**Congressi della collaborazione ATLAS :** si tratta di congressi legati a gruppi di lavoro che coordinavo in quel momento. Sono stato coinvolto nella scelta della sede, nella definizione del formato, del programma, e dei relatori, e nel caso del congresso a Milano ho gestito tutti i dettagli dell'organizzazione locale.

- *Third generation squark searches* tenutosi a Milano nel giugno 2014 cui hanno partecipato 42 persone.
- *SUSY* tenutosi a Sussex nell'aprile 2016, cui hanno partecipato 137 persone
- *SUSY and Exotics* tenutosi a Bucharest in maggio 2017, cui hanno partecipato 261 persone.
- Congresso sulle attività di *fisica e upgrade di ATLAS Italia* tenutosi a Napoli nel novembre 2016 cui hanno partecipato 110 persone.
- Congresso sulle attività di *fisica e upgrade di ATLAS Italia* tenutosi a Pavia nell'ottobre 2017, cui hanno partecipato 85 persone.

## Relazioni a conferenze

**Conferenze internazionali :**

- **C1** Measurements of spatial resolution of ATLAS pixel detectors, *Pixel 2000*, Genova 2000.
- **C2** Test Beam results of ATLAS Pixel sensors, *Pixel 2002*, Carmel (CA), 2002.
- **C3** Measurement of trapping time constants in irradiated DOFZ silicon with test beam data, *Frontier Detectors for Frontier Physics*, La Biodola 2003.
- **C4** Radiation hardness studies of silicon pixel detectors, *Vertex 2004*, Menaggio (Lago di Como) 2004.
- **C5** Simulation of Signals in Ultra-Radiation hard silicon pixel detectors, *IEEE Nuclear Physics Symposium*, Roma 2004.

- **C6** SUSY studies with ATLAS: hadronic signatures and Focus Point, *Physics at LHC*, Vienna 2004.
- **C7** Search for Supersymmetry with early ATLAS data, *Frontier Science 2005*, Milano 2005.
- **C8** Supersymmetry measurements with ATLAS, *LHC-DM09*, Ann Arbor 2009.
- **C9** Recent results from new physics searches at ATLAS, *Physics at LHC*, Perugia 2011.
- **C10** Searches for direct pair production of third generation squarks with the ATLAS detector, *EPS-HEP*, Stockholm 2013.
- **C11** ATLAS results on SUSY searches, *SUSY 2015*, Lake Tahoe 2015.
- **C12** Searches for direct pair production of third generation squarks in final states with no leptons with the ATLAS detector, *EPS-HEP*, Venezia 2017.
- **C13** Beyond Standard Model searches at LHC, Relazione su invito a *Pushing the boundaries of the energy and intensity frontiers*, Durham 2018.

#### **Conferenze e workshop nazionali :**

- **C14** Searches for New Physics at the LHC, *Incontri di Fisica delle Alte Energie*, Torino 2004.
- **C15** Reconstruction of sparticles masses at the LHC, *Incontri di Fisica delle Alte Energie*, Catania 2005.
- **C16** Search for Supersymmetry with early ATLAS data, *Incontri di Fisica delle Alte Energie*, Pavia 2006.
- **C17** Rassegna e stato del rivelatore a pixel di ATLAS, *Congresso Nazionale SIF*, Pisa 2007.
- **C18** Supersymmetry searches with the ATLAS detector, *Galileo Galilei Institute workshop*, Firenze 2011.
- **C19** Can the world be supersymmetric ? The scenario after the first LHC run, *Congresso Nazionale SIF*, Pisa 2014. (**su invito**)

## **Ruoli di docenza in scuole internazionali**

- Ho tenuto il corso sulla Supersimmetria all'*Hadron Collider School* tenuta a Gottinga nel luglio 2013<sup>10</sup>.
- Ho tenuto il corso sulla Supersimmetria all'*Hadron Collider School* tenuta a Gottinga nel luglio 2014<sup>11</sup>.

## Terza missione

- **Responsabile delle attività di outreach di ATLAS Italia** da Ottobre 2016 a Settembre 2017. Attività principali : mantenimento pagina Facebook e sito di Atlas Italia, preparazione e revisione di articoli su novità e iniziative di interesse per il pubblico. Da Ottobre 2017, ho continuato ad essere membro del gruppo di outreach di ATLAS Italia.
- Guida in diverse visite al CERN organizzate per studenti del dipartimento di Fisica di Milano
- Videoconferenza dal CERN con il pubblico di Zrenjanin (Serbia) nel contesto della Notte Europea dei Ricercatori del 2012
- Guida della mostra “extreme” al Museo della Scienza di Milano durante la Notte Europea dei Ricercatori del 2017
- Responsabile delle attività di outreach di ATLAS Italia da Ottobre 2016 a Settembre 2017. Attività principali : mantenimento pagina Facebook e sito di Atlas Italia, preparazione e revisione di articoli su novità e iniziative di interesse per il pubblico.
- Pubblicazione di articoli sul CERN Courier [PR38] e sulla pagina per il pubblico di ATLAS

## Attività di ricerca scientifica

Dal 1999 la mia attività di ricerca si è svolta principalmente nell’ambito di ATLAS, un esperimento del CERN per lo studio della rottura della simmetria elettrodebole e la ricerca di nuovi fenomeni a quella scala di energia. La mia attività include due linee principali. La prima è la caratterizzazione dei rivelatori a pixel dell’esperimento, con particolare attenzione agli effetti di danneggiamento da radiazione. La seconda è l’analisi dati, in particolare la ricerca di particelle supersimmetriche. Nel seguito descrivo in dettaglio il mio contributo a ciascuna di queste linee di ricerca.

*Chiave per le referenze fornite nella descrizione dell’attività di ricerca : [12] articolo su rivista o libro, elenco in calce al CV; [PR1] lavoro non pubblicato su rivista o*

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<sup>10</sup><https://indico.cern.ch/event/232639/timetable/>  
<sup>11</sup><https://indico.cern.ch/event/292887/timetable/>

*libro, elenco in calce al CV; [C2] presentazione a conferenze, elenco sopra; [T3] tesi di cui sono stato supervisore, elenco in calce al CV*

### **Esperimento ATLAS, analisi dati**

#### **Ricerche di Supersimmetria prima della presa dati (2003-2009).**

Prima che fossero disponibili i dati raccolti ad LHC ho lavorato allo sviluppo di strategie di analisi. Mi sono occupato in particolare dello studio della regione di “Focus Point” dei modelli mSUGRA, caratterizzata da un segnale costituito dalla produzione di gluini che decadono mediante quark di terza generazione in neutralini e chargini. Oggi questo è una tipologia di segnale tra le più cercate nelle analisi dei dati di LHC, ma nel 2003 sono stato tra i primi a studiarla. Ho mostrato i miei studi alla conferenza *Physics at LHC* nel 2004 [C6] ed agli *Incontri di Fisica delle Alte Energie* nel 2005 [C15]. I risultati di questo studio sono poi diventati oggetto di una pubblicazione [6]. Un altro articolo [8] tratta della complementarietà tra le misure effettuabili ad LHC e quelle basate sull’osservazione di raggi  $\gamma$  provenienti dall’annichilazione di neutralini al centro della Galassia. Ho anche studiato per la prima volta la possibilità di rivelare di coppie di top scalari relativamente leggeri ( $100\text{-}150 \text{ GeV}/c^2$ ) ad LHC, definendo punti di benchmark nello spazio dei parametri in collaborazione con teorici, e sviluppando una tecnica basata sui dati per la stima del difficile fondo di top. Questo studio è documentato in una nota interna di ATLAS [PR8] e nei proceedings del workshop di Les Houches 2005 [PR36]. Ho inoltre presentato a nome della collaborazione rassegne riguardanti la preparazione delle analisi di supersimmetria di ATLAS in diverse conferenze internazionali [C7, C8] e nazionali [C16].

**Misure di fisica del quark top (2010-2011).** Con l’entrata in funzionamento di LHC alla fine del 2009, mi sono occupato dello studio della produzione di coppie di quark top, un processo di grande interesse in sè ma anche uno dei fondi principali alle ricerche di supersimmetria che avevo intenzione di effettuare successivamente. Ho contribuito alla stima del fondo dovuto alla produzione di bosoni W in associazione a getti, nell’ambito della prima misura di sezione durto di coppie di quark top con ATLAS [PR10, PR14, PR16, PR18, 36]. Ho poi contribuito alla prima misura di asimmetria di carica in eventi con coppie di top [PR20, 153].

**Ricerche di supersimmetria (2009-2018).** All’inizio della presa dati ero coordinatore del gruppo di lavoro sulla stima dei fondi ad analisi di ricerca di particelle supersimmetriche. Ho svolto questo incarico tra ottobre 2009 ed il settembre 2010, un periodo durante il quale si sono sviluppate quelle tecniche di stima dei fondi che sono state usate nelle prime pubblicazioni del gruppo SUSY di ATLAS [45, 47, 53]. Molti dei concetti fondamentali sviluppati in quel periodo, quali le regioni di controllo e validazione per la normalizzazione dei

processi di fondo e la verifica della bontà delle stime, sono poi diventati parte integrante delle ricerche di supersimmetria di ATLAS fino alla data presente.

Nel frattempo lavoravo allo sviluppo di un analisi per la ricerca di squark e gluini, e sucessivamente di top squark, in eventi con due elettroni o muoni. Ho anche coordinato il gruppo di persone che si occupava di questo canale, e che ha incluso negli anni colleghi di cinque istituti italiani e tre stranieri, tra il 2009 ed il 2014. Questa attività ha portato alla pubblicazione di cinque articoli [55, 56, 109, 215, 310]. Dopo il completamento delle analisi sui dati del primo run di LHC (2009-2012) e in attesa di quelli del secondo run (2015-2018) ho poi contribuito ad altre tre analisi, riguardanti la ricerca di top squark in eventi con leptoni tau [498], in eventi con un leptone [464] e i vincoli posti da tutte le ricerche SUSY sullo spazio dei parametri del modello supersimmetrico minimale [476].

Tra il 2011 ed il 2013 ho coordinato le ricerche di squark della terza generazione. A causa del ruolo del quark stop nel cancellare le correzioni radiative alla massa del bosone di Higgs, queste ricerche hanno grande interesse ed hanno portato alla pubblicazione di sei articoli coi dati raccolti nel 2011 [171, 203, 205, 209, 213, 215] e sei articoli con quelli raccolti nel 2012 [285, 309, 310, 335, 343, 345] che sono stati completati sotto la mia direzione.

Tra il 2014 ed il 2016 sono stato coordinatore delle ricerche di supersimmetria di ATLAS, un gruppo di lavoro che include la partecipazione attiva di circa 300 ricercatori e studenti. Mi sono occupato del completamento delle analisi sui dati raccolti nel 2012 : 34 articoli [285, 286, 291, 292, 301, 307, 309, 310, 315, 322, 328, 335, 342, 343, 344, 345, 347, 374, 392, 404, 407, 409, 414, 421, 441, 450, 464, 468, 469, 476, 492, 494, 498, 529] sulla ricerca di SUSY sono stati pubblicati da ATLAS con tutta la statistica disponibile tra il 2013 ed il 2016. Inoltre mi sono occupato della preparazione e dello svolgimento delle analisi dei dati raccolti nel secondo run di LHC. Alla scadenza del mio mandato, 11 articoli erano stati sottomessi a rivista con i dati del 2015 [535, 537, 552, 558, 559, 563, 575, 580, 584, 585, 591].

Con l'aumentare della luminosità integrata disponibile, ricerche di particelle prodotte con minore sezione d'urto diventano sempre più interessanti. Tra Aprile 2017 e Marzo 2018 ho coordinato le ricerche di produzione mediante interazione elettrodebole di particelle supersimmetriche, occupandomi in particolare della pubblicazioni delle analisi con i dati raccolti nel 2015 e 2016 [686,727]. Ho anche partecipato direttamente alle analisi per la ricerca di produzione diretta di leptoni scalari [PR32a, PR32b] e alla ricerca di neutralini e chargini con spettri di massa compresi [PR33, 727], uno scenario che si riteneva fosse accessibile solo a collisori leptonici. Ho poi contribuito ad un analisi i cui risultati preliminari [PR34a, PR34b] mettono forti limiti sulla produzione diretta di chargini che decadono in bosoni W e neutralini, migliorando di oltre un fattore due i limiti precedenti esistenti.

Ho inoltre presentato a nome della collaborazione rassegne riguardanti i risultati delle analisi dei dati di LHC per ricerche di supersimmetria o di Nuova Fisica in generale a diverse conferenze internazionali [C9, C10, C11, C12, C13] e nazionali [C18, C19].

## **Esperimento ATLAS : rivelatore di vertice a Pixel**

Tra il 1999 ed il 2009 ho lavorato al programma di ricerca e sviluppo legato alla costruzione del rivelatore (installato nel 2007) e al suo commissioning con raggi cosmici.

Ho partecipato alla realizzazione del programma di ricostruzione dei dati di test beam [PR5] e alla loro analisi, studiando la risoluzione spaziale, la raccolta di carica, l'efficienza, lo spessore di svuotamento e l'angolo di Lorentz dei rivelatori. In particolare ho sviluppato algoritmi per una migliore ricostruzione della posizione, ed un metodo per misurare la vita media dei portatori di carica in silicio irraggiato.

Ho sviluppato un modello dettagliato di raccolta delle coppie elettrone buca create da particelle cariche nei sensori, tenendo conto della variazioni di angolo di Lorentz con il campo elettrico e degli effetti di danneggiamento da radiazione.

Ho studiato con dati presi con un fascio ad alta intensità la dipendenza dell'efficienza di rivelazione e della risoluzione spaziale dalla sincronizzazione dell'elettronica di lettura rispetto alle particelle del fascio, nonché l'uniformità nella risposta temporale dei singoli canali di lettura.

Questi studi costituiscono il cuore della mia tesi di dottorato [PR2] e di una pubblicazione [18]. Sono anche documentati in tre note interne di ATLAS [PR3, PR4, PR6]. Essi hanno contribuito allo sviluppo del progetto definitivo del rivelatore a pixel [17] e ne ha dimostrato la capacità di fornire le prestazioni richieste anche dopo l'irraggiamento. Ho presentato questi studi in quattro conferenze internazionali [C1, C2, C3, C4].

Successivamente all'installazione del rivelatore in ATLAS, ho analizzato dati di raggi cosmici per verificarne il buon funzionamento, misurando nuovamente l'angolo di Lorentz. Ho inoltre sviluppato il software ufficiale di ATLAS per la ricostruzione delle coordinate dei clusters del rivelatore a pixel.

A partire dal 2016, faccio parte di un gruppo che studia gli effetti dei danni da radiazione, confrontando le predizioni di modelli numerici con i dati raccolti ad LHC. Il modello è stato utilizzato per decidere i parametri operativi del rivelatore a pixel (tensione di svuotamento e soglia) nel 2017 e 2018 ed è in corso di implementazione nel software ufficiale di simulazione del rivelatore di ATLAS. Il modello è anche utilizzato nelle previsioni delle prestazioni del rivelatore a pixel per l'upgrade di alta luminosità.

## **Esperimento ATLAS : altre attività**

Da Ottobre 2017 sono coordinatore delle analisi di fisica e performance di ATLAS Italia, dopo aver svolto il ruolo di vice coordinatore nei dodici mesi precedenti. Il coordinatore delle analisi e' il punto di riferimento della comunità italiana di ATLAS per quanto riguarda l'analisi dati. Il suo ruolo è di promuovere la conoscenza delle attività compiute dai vari gruppi, favorirne l'aggregazione, segnalare situazioni di insufficienza o criticità e suggerire soluzioni per il loro

superamento; armonizzare l'utilizzo delle risorse di calcolo in contatto con il responsabile nazionale ed il responsabile di calcolo; occuparsi dell'assegnazione di presentazioni per conferenze nazionali (quali il congresso SIF e IFAE), della revisione delle presentazioni in questione e dei proceedings; organizzare un workshop annuale sulle analisi di Atlas Italia (l'ultimo si è tenuto a Pavia nell'ottobre 2017); valorizzare le attività nazionali in tutte le sedi opportune (ATLAS, workshops, conferenze, etc.) e svolgere un ruolo di riferimento nei confronti della commissione 1 per le attività di analisi nel loro complesso.

Da Dicembre 2016 sono coordinatore di *FastChain*, un progetto per ridurre la CPU necessaria per la produzione di eventi MonteCarlo di due ordini di grandezza. Il progetto ha un'importanza critica per ATLAS, in quanto le richieste di statistica di eventi Monte Carlo sono in continuo aumento con l'aumentare della luminosità integrata disponibile. Già oggi molte analisi di alto profilo hanno la statistica MonteCarlo tra le principali incertezze sistematiche. Il progetto è molto complesso, e riguarda la simulazione delle interazioni delle particelle con il rivelatore, la simulazione della raccolta del segnale nei vari rivelatori, e la ricostruzione delle tracce in eventi simulati. L'obiettivo è rendere *Fast Chain* il programma di simulazione di default per i campioni simulati prodotti per il run3 di LHC (2021-2023).

Sono stato il direttore del pannello di revisione (*editorial board*) di ATLAS per un articolo di ricerca di supersimmetria [708] e membro del pannello di altri quattro articoli : misura di spin correlation in  $t\bar{t}$  [400], sezione d'urto di produzione  $t\bar{t}$  in associazione a quark pesanti [266], sezione d'urto di produzione di bosoni W e Z con quark pesanti [90,91].

### Attività di ricerca non legate ad ATLAS

**MACRO (1997-1999)** : Ho lavorato a questo esperimento sotto la supervisione del Prof. G. Giacomelli prima durante la mia tesi di laurea [PR1] e poi con una borsa di studio presso i Laboratori del Gran Sasso, da Aprile 1998 a Marzo 1999. Il rivelatore MACRO si trovava nei laboratori sotterranei del Gran Sasso, e studiava la componente penetrante e di alta energia dei raggi cosmici. Una delle linee principali di ricerca era la ricerca di monopoli magnetici supermassivi ( $m \sim 10^{16}$  GeV) prodotti durante i primi istanti di vita dell'universo. Durante la tesi mi sono occupato di calcolare la perdita di energia nella materia di particelle con carica magnetica multipla di quella minima ( $\hbar c/2e$ ) e di particelle con carica magnetica ed elettrica (dioni). Ho calcolato la perdita di energia all'interno della Terra per valutare l'angolo solido di accettanza del rivelatore in funzione della massa e della carica. Il risultato di questo lavoro è stato pubblicato su Astroparticle Physics [1]. Ho poi calcolato la perdita di energia dei monopoli negli scintillatori, nel gas dei tubi a streamer limitato e nel rivelatore nucleare a tracce di MACRO, e la risposta di questi rivelatori, lavoro pubblicato in un secondo articolo [2]. Ho poi effettuato un'analisi dei dati degli scintillatori

di MACRO per la ricerca di monopoli magnetici ed altre particelle fortemente ionizzanti, come i nucleariti [11].

**RD50 (2002-2004)** : La collaborazione RD50 si è formata per sviluppare rivelatori di vertice maggiormente resistenti alle radiazioni. Tra il 2002 ed il 2004 ho usato il programma di simulazione che avevo scritto per studiare il comportamento di rivelatori a pixel irraggiati per studiare la raccolta del segnale in funzione del materiale utilizzato (silicio Float-Zone standard ed ossigenato, silicio Czochralski ed epitassiale), del tipo di drogaggio ( $n$ -on- $p$ ,  $n$ -on- $n$ ,  $p$ -on- $n$ ), della geometria (spessore del sensore e dimensioni del pixel) e delle condizioni operative (temperatura, campo elettrico). Queste simulazioni consentono di guidare il processo di Ricerca e Sviluppo di nuovi rivelatori. Ho presentato questi studi in due conferenze internazionali [C4, C5].

**Sviluppo di rivelatori a pixel di diamante (2002)** : Durante il periodo trascorso a Bonn ho analizzato dati di test beam presi con rivelatori a pixel che usavano diamante come materiale sensibile. Tali rivelatori sono promettenti per la loro maggiore resistenza ai danni da radiazione, ma presentano ancora dei problemi di omogeneità e raccolta di carica in quanto utilizzano materiale policristallino. Analizzando questi dati e sfruttando l'elevata granularità dei rivelatori a pixel di ATLAS ho messo in luce per la prima volta come la ricostruzione della posizione sia influenzata dalla struttura policristallina del materiale, che provocava variazioni locali (al livello del singolo cristallo) dell'ordine di 20 micrometri nella posizione in cui veniva raccolta la carica rispetto alla posizione di passaggio della particella. Ho poi scritto un programma di simulazione per descrivere la raccolta di carica e la risposta di questi rivelatori a particelle ionizzanti, che ha permesso di spiegare il comportamento osservato nei dati come derivante dai campi elettrici di polarizzazione creati dalle cariche intrappolate nella regione di confine tra diversi cristalli. L'analisi e la simulazione dei dati presi con rivelatori al diamante è stata oggetto di una pubblicazione di cui io sono primo autore [4].

## Attività didattica

Ho svolto attività didattica come assistente per i seguenti laboratori:

- Corso di Laboratorio di Fisica per Scienze Biologiche, Anno Accademico 1999/2000, Università degli Studi di Milano. Durante il corso venivano insegnati agli studenti i fondamenti del trattamento statistico delle misure e degli errori associati. L'esperimento di laboratorio consisteva nella misura della costante di Faraday utilizzando l'elettrolisi di una soluzione di  $\text{CuSO}_4$ .

- Corso di Laboratorio di Programmazione 2, Anno Accademico 2003/04, Università degli Studi di Milano. Durante il corso si insegnava agli studenti la programmazione in linguaggio C. Veniva proposto un esercitazione a scelta tra la simulazione di un esperimento (misura della relazione tra indice di rifrazione e lunghezza d'onda con uno spettrometro a prisma) e lo sviluppo di un programma per acquisire la funzione d'onda misurata da un'oscilloscopio e caratterizzare un circuito RLC.

A partire dall'anno accademico 2014-2015 alla data presente, sono membro del Collegio dei Docenti del corso di Dottorato in Fisica dell'Università di Milano.

## Partecipazione a scuole e corsi di formazione

- Corso di formazione INFN *Corso di formazione manageriale per ricercatori e tecnologi INFN*, Legnaro, Ottobre 2017
- Corso di formazione INFN *Corso di comunicazione scientifica*, Milano, Maggio 2017
- XIII seminario di Fisica Nucleare e Subnucleare, Otranto, 21-27 Settembre 2000
- Giornate di Studio sui rivelatori, Torino 27 febbraio - 1 marzo 2001.
- Lezioni su software e calcolo Moderno, Torino 1-2 marzo 2001.
- IX corso specialistico su *linguaggio c++ ed analisi e disegno nella programmazione ad oggetti*, bologna, 26-30 marzo 2001.
- Scottish University Summer School in Physics on heavy flavour physics, St. Andrews (Scotland) 7-23 agosto 2001.

## Lavori a stampa

**Per le pubblicazioni su rivista, si veda l'elenco allegato alla domanda.**

### Tesi

- **PR1** T. Lari, Ricerca di monopoli magnetici con il rivelatore MACRO al Gran Sasso, **diploma thesis**, Bologna 1998.
- **PR2** T. Lari, Study of silicon pixel sensors for the ATLAS detector, **PhD thesis**, CERN-THESIS-2001-028, Milano 2001.

## Note della collaborazione ATLAS

- **PR3** T. Lari, Alignment of irradiated and not irradiated pixel sensors in test-beam operation, ATL-INDET-2001-002.
- **PR4** T. Lari, *Lorentz angle variation with electric field for ATLAS silicon detectors*, ATL-INDET-2001-004.
- **PR5** A. Andreazza et al., H8 ATLAS Pixel test beam analysis program - User Guide, ATL-INDET-2003-009.
- **PR6** G. Alimonti et al., A study of charge trapping in irradiated silicon with test beam data, ATL-INDET-2003-014.
- **PR7** T. Lari, A Geant4 simulation of not irradiated and irradiated pixel detectors, ATL-INDET-2003-015.
- **PR8** T. Lari and G. Polesello, A study on the detection of a light stop quark with the ATLAS detector at LHC, ATL-PHYS-CONF-2006-001.
- **PR9** J. Abdallah et al., Prospects for SUSY discovery based on inclusive searches with the ATLAS detector at the LHC, ATL-COM-PHYS-2009-261.
- **PR10** B. Acharya et al., Prospects for measuring the Top Quark Pair Production Cross-section in the Single Lepton Channel at ATLAS in 10 TeV p-p Collisions, ATL-PHYS-INT-2009-071.
- **PR11** A. Barr et al, Details on Early supersymmetry searches with jets, missing transverse momentum and one or more leptons with the ATLAS Detector, ATL-PHYS-INT-2010-083.
- **PR12** M. Arrouche et al., Wenu and Zee observations supporting note, ATL-PHYS-INT-2010-109.
- **PR13** M. Arrouche et al.,  $W \rightarrow e\nu$  and  $Z \rightarrow ee$  cross-section measurements in proton-proton collisions at  $\sqrt{s} = 7$  TeV with the ATLAS Detector : Support note to publication, ATL-PHYS-INT-2010-130.
- **PR14** B. Acharya et al., Estimation of the W+Jets Background for Top Quark Re-Discovery in the Single Lepton+Jets Channel, ATL-PHYS-INT-2010-136.
- **PR15** B. Abi et al., Mis-identified lepton backgrounds to top quark pair production : Supporting note 5, ATL-PHYS-INT-2010-139.
- **PR16** B. Acharya et al., Cut-and-count measurement of the top quark pair production in the semileptonic decay channel at  $\sqrt{s} = 7$  TeV with the ATLAS detector, ATL-PHYS-INT-2011-048.

- **PR17** A. Alonso et al., Searching for Supersymmetry with two leptons and missing transverse momentum at  $\sqrt{s} = 7$  TeV, ATL-PHYS-INT-2011-091.
- **PR18** B. Acharya et al., Measurement of the Top Quark Pair Production Cross-section in ATLAS in the Single Lepton plus Jets Channel, ATL-COM-PHYS-2011-666.
- **PR19** S. Asai et al., Search for Supersymmetry with jets and missing transverse momentum and one lepton at  $\sqrt{s} = 7$  TeV, ATL-PHYSINT-2011-082.
- **PR20** B. Acharya et al., Measurement of the top quark charge asymmetry in pp collisions data at  $\sqrt{s} = 7$  TeV using the ATLAS detector, ATL-PHYS-INT-2011-063
- **PR21** A. Alonso et al., Constraining the gauge-mediated Supersymmetry breaking model in final states with two leptons, jets and missing transverse momentum with the ATLAS experiment at  $\sqrt(s) = 7$  TeV, ATL-PHYS-INT-2011-096.
- **PR22** M. Bianco et al., Search for an heavy top partner in final states with two leptons, ATL-PHYS-INT-2012-077.
- **PR23** M.I. Besana et al., Search for a scalar top decaying to a chargino and a b-quark in final states with two leptons, ATL-PHYS-INT-2012-102.
- **PR24** M.I. Besana et al., Search for a scalar top decaying to a chargino and a b-quark in final states with two leptons, ATL-PHYS-INT-2013-022.
- **PR25** M.I. Besana and T. Lari, Search for a scalar top decaying to tau-sleptons, b-jets and neutrinos in final states with two leptons, ATL-PHYS-INT-2014-010.
- **PR26** M. Besana et al., Search for a scalar top in final states with two leptons and intermediate values of  $m_{T2}$ , ATL-COM-PHYS-2014-754
- **PR27** A. Barr et al., Summary of the ATLAS experiment's sensitivity to supersymmetry after LHC Run 1 - interpreted in the phenomenological MSSM, ATL-COM-PHYS-2014-952.
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678. ATLAS Collaboration, *Measurements of top-quark pair differential cross-sections in the lepton+jets channel in  $pp$  collisions at  $\sqrt{s} = 13$  TeV using the ATLAS detector*, JHEP 11 (2017) 191
679. ATLAS Collaboration, *Measurement of inclusive and differential cross sections in the  $H \rightarrow ZZ^* \rightarrow 4\ell$  decay channel in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 10 (2017) 132
680. ATLAS Collaboration, *Search for new phenomena with large jet multiplicities and missing transverse momentum using large-radius jets and flavour-tagging at ATLAS in 13 TeV  $pp$  collisions*, JHEP 12 (2017) 034
681. ATLAS Collaboration, *Search for direct top squark pair production in final states with two leptons in  $\sqrt{s} = 13$  pp collisions with the ATLAS detector*, Eur. Phys. J. C77 (2017) 898
682. ATLAS Collaboration, *Evidence for the  $H \rightarrow b\bar{b}$  decay with the ATLAS detector*, JHEP 12 (2017) 024
683. ATLAS Collaboration, *Measurement of multi-particle azimuthal correlations with the subevent cumulant method in  $pp$  and  $p+Pb$  collisions with the ATLAS detector at the LHC*, Phys. Rev. C 97 (2018) 024904
684. ATLAS Collaboration, *Measurement of the exclusive  $\gamma\gamma \rightarrow \mu\mu$  process in proton-proton collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Lett. B 777 (2018) 303
685. ATLAS Collaboration, *Search for diboson resonances with boson-tagged jets in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Lett. B 777 (2018) 91
686. ATLAS Collaboration, *Search for the direct production of charginos and neutralinos in  $\sqrt{s} = 13$  TeV  $pp$  collisions with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 154

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688. ATLAS Collaboration, *Search for supersymmetry in events with b-tagged jets and missing transverse momentum in pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 11 (2017) 195
689. ATLAS Collaboration, *Search for an invisibly decaying Higgs boson or dark matter candidates produced in association with a Z boson in pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Lett. B 776 (2017) 318
690. ATLAS Collaboration, *Searches for heavy ZZ and ZW resonances in the  $\ell\ell qq$  and  $\nu\nu qq$  final states in pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 03 (2018) 009
691. ATLAS Collaboration, *Measurement of longitudinal flow de-correlations in Pb+Pb collisions at  $\sqrt{s_{NN}} = 2.76$  and 5.02 TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 142
692. ATLAS Collaboration, *Measurement of quarkonium production in proton-lead and proton-proton collisions at 5.02 TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 171
693. ATLAS Collaboration, *Measurement of  $\tau$  polarisation in  $Z/\gamma^* \rightarrow \tau\tau$  decays in proton-proton collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 163
694. ATLAS Collaboration, *Search for a scalar partner of the top quark in the jets plus missing transverse momentum final state at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 12 (2017) 085
695. ATLAS Collaboration, *Direct top-quark decay width measurement in the  $t\bar{t}$  lepton+jets channel at  $\sqrt{s} = 8$  TeV with the ATLAS experiment*, Eur. Phys. J. C 78 (2018) 129
696. ATLAS and CMS Collaborations, *Combination of inclusive and differential  $t\bar{t}$  charge asymmetry measurements using ATLAS and CMS data at  $\sqrt{s} = 7$  and 8 TeV*, JHEP 04 (2018) 033
697. ATLAS Collaboration, *A search for resonances decaying into a Higgs boson and a new particle X in the  $XHqqbb$  final state with the ATLAS detector*, Phys. Lett. B 779 (2018) 24
698. ATLAS Collaboration, *Search for additional heavy neutral Higgs and gauge bosons in the ditau final state produced in  $36\text{ fb}^{-1}$  of pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 01 (2018) 055

699. ATLAS Collaboration,  *$ZZ \rightarrow 4\ell$  cross-section measurements and search for anomalous triple gauge couplings in 13 TeV  $pp$  collisions with the ATLAS detector*, Phys. Rev. D 97 (2018) 032005
700. ATLAS Collaboration, *Study of ordered hadron chains with the ATLAS detector*, Phys. Rev. D 96 (2017) 092008
701. ATLAS Collaboration, *Measurement of lepton differential distributions and the top quark mass in  $t\bar{t}$  production in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, Eur. Phys. J. C 77 (2017) 804
702. ATLAS Collaboration, *Measurement of the cross-section for electroweak production of dijets in association with a Z boson in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Physics Letters B 775 (2017) 206
703. ATLAS Collaboration, *Search for new phenomena in high-mass final states with a photon and a jet from  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 102
704. ATLAS Collaboration, *Search for heavy resonances decaying into WW in the  $e\nu\mu\nu$  final state in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 24
705. ATLAS Collaboration, *Measurement of the production cross-section of a single top quark in association with a Z boson in proton-proton collisions at 13 TeV with the ATLAS detector*, Phys. Lett. B 780 (2018) 557
706. ATLAS Collaboration, *Search for long-lived, massive particles in events with displaced vertices and missing transverse momentum in  $\sqrt{s} = 13$  TeV  $pp$  collisions with the ATLAS detector*, Phys. Rev. D 97 (2018) 052012
707. ATLAS Collaboration, *Measurement of the Drell-Yan triple-differential cross section in  $pp$  collisions at  $\sqrt{s} = 8$  TeV*, JHEP 12 (2017) 059
708. ATLAS Collaboration, *A search for B-L R-parity-violating top squarks in  $\sqrt{s} = 13$  TeV  $pp$  collisions with the ATLAS experiment*, Phys. Rev. D 97 (2018) 032003
709. ATLAS Collaboration, *A search for pair-produced resonances in four-jet final states at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 250
710. ATLAS Collaboration, *Search for WW/WZ resonance production in  $\ell\nu qq$  final states in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 03 (2018) 042
711. ATLAS Collaboration, *Measurement of differential cross sections of isolated-photon plus heavy-flavour jet production in  $pp$  collisions at  $\sqrt{s} = 8$  TeV using the ATLAS detector*, Phys. Lett. B 776 (2018) 295

712. ATLAS Collaboration, *Search for doubly charged Higgs boson production in multi-lepton final states with the ATLAS detector using proton-proton collisions at  $\sqrt{s} = 13$  TeV*, Eur. Phys. J. C 78 (2018) 199
713. ATLAS Collaboration, *Search for dark matter produced in association with bottom or top quarks in  $\sqrt{s} = 13$  TeV pp collisions with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 18
714. ATLAS Collaboration, *Search for Supersymmetry in final states with missing transverse momentum and multiple b-jets in proton–proton collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 06 (2018) 107
715. ATLAS Collaboration, *Measurement of inclusive jet and dijet cross-sections in proton-proton collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 05 (2018) 195
716. ATLAS Collaboration, *Measurement of differential cross sections and  $W^+ / W^-$  cross-section ratios for  $W$  boson production in association with jets at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, JHEP 05 (2018) 077
717. ATLAS Collaboration, *Search for dark matter and other new phenomena in events with an energetic jet and large missing transverse momentum using the ATLAS detector*, JHEP 01 (2018) 126
718. ATLAS Collaboration, *Search for top-squark pair production in final states with one lepton, jets, and missing transverse momentum using  $36\text{ fb}^{-1}$  of  $\sqrt{s} = 13$  TeV pp collision data with the ATLAS detector*, JHEP 06 (2018) 108
719. ATLAS Collaboration, *Measurement of differential cross-sections of a single top quark produced in association with a  $W$  boson at  $\sqrt{s} = 13$  TeV with ATLAS*, Eur. Phys. J. C 78 (2018) 186
720. ATLAS Collaboration, *Search for long-lived charginos based on a disappearing-track signature in pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 06 (2018) 022
721. ATLAS Collaboration, *Measurement of the Higgs boson coupling properties in the  $H \rightarrow 4l$  decay channel at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, JHEP 03 (2018) 095
722. ATLAS Collaboration, *Search for squarks and gluinos in final states with jets and missing transverse momentum using  $36\text{ fb}^{-1}$  of  $\sqrt{s} = 13$  TeV pp collision data with the ATLAS detector*, Phys. Rev. D 97 (2018) 112001
723. ATLAS Collaboration, *Search for heavy resonances decaying into a  $W$  or  $Z$  boson and a Higgs boson in final states with leptons and b-jets in  $36\text{ fb}^{-1}$  of  $\sqrt{s} = 13$  TeV pp collisions with the ATLAS detector*, JHEP 03 (2018) 174

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725. ATLAS Collaboration, *Measurement of the production cross section of three isolated photons in pp collisions at  $\sqrt{s} = 8$  TeV using the ATLAS detector*, Phys. Lett. B 781 (2018) 55
726. ATLAS Collaboration, *Measurement of the inclusive and fiducial  $t\bar{t}$  production cross-sections in the lepton+jets channel in pp collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 487
727. ATLAS Collaboration, *Search for electroweak production of supersymmetric states in scenarios with compressed mass spectra at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Rev. D 97 (2018) 052010
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730. ATLAS Collaboration, *Measurement of the cross section for isolated-photon plus jet production in pp collisions at  $\sqrt{s} = 13$  TeV using the ATLAS detector*, Phys. Lett. B 780 (2018) 578
731. ATLAS Collaboration, *Search for High-Mass Resonances Decaying to  $\tau\nu$  in pp Collisions at  $\sqrt{s} = 13$  TeV with the ATLAS Detector*, Phys. Rev. Lett. 120 (2018) 161802
732. ATLAS Collaboration, *Search for  $W' \rightarrow tb$  decays in the hadronic final state using pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Lett. B 781 (2018) 327
733. ATLAS Collaboration, *Search for a Structure in the  $B_s^{0*}\pm$  Invariant Mass Spectrum with the ATLAS Experiment*, Phys. Rev. Lett. 120 (2018) 202007
734. ATLAS Collaboration, *Search for photonic signatures of gauge-mediated supersymmetry in 13 TeV pp collisions with the ATLAS detector*, Phys. Rev. D 97 (2018) 092006
735. ATLAS Collaboration, *Search for Higgs boson decays to beyond-the-Standard-Model light bosons in four-lepton events with the ATLAS detector at  $\sqrt{s} = 13$  TeV*, JHEP 06 (2018) 166

736. ATLAS Collaboration, *Search for the Decay of the Higgs Boson to Charm Quarks with the ATLAS Experiment*, Phys. Rev. Lett. 120 (2018) 211802
737. ATLAS Collaboration, *Search for pair production of up-type vector-like quarks and for four-top-quark events in final states with multiple b-jets with the ATLAS detector*, JHEP 07 (2018) 089
738. ATLAS Collaboration, *Search for Higgs boson decays into pairs of light (pseudo)scalar particles in the  $\gamma\gamma jj$  final state in pp collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Phys. Lett. B 782 (2018) 750
739. ATLAS Collaboration, *Search for heavy particles decaying into top-quark pairs using lepton-plus-jets events in proton-proton collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector*, Eur. Phys. J. C 78 (2018) 565

## **Proceedings di conferenze, pubblicati su rivista o libro**

740. T. Lari, *Measurements of spatial resolution of ATLAS pixel detectors*, Pixel 2000, Genova (Italy) June 5-8, 2000, Nucl. Instr. and Meth. A465 (2001) 112.
741. T. Lari, *Measurement of trapping time constants in irradiated DOFZ silicon with test beam data*, Frontier Detectors for Frontier Physics, La Biodola, Isola d'Elba (Italy) May 25-31, 2003, Nucl. Instr. and Meth. A518 (2004) 349.
742. L. Fano and T. Lari, *Energy flow algorithms in ATLAS and CMS*, First Italian Workshop on ATLAS and CMS physics, Pisa (Italy), 10-11 June 2003, libro edito da F. Palla per la Società Italiana di Fisica (2004), p.59.
743. T. Lari, *SUSY studies with ATLAS: hadronic signatures and Focus Point*, presentazione a “Physics at LHC”, Vienna 13-17 Luglio 2004, Czech. J. Phys. 55 (2005) B265.
744. T. Lari, *Reconstruction of sparticles masses at the LHC*, presentazione agli *Incontri di Fisica delle Alte Energie*, Catania, 31 Marzo - 2 Aprile 2005, pubblicato su Amer. Inst. Phys. Conf. Proc. 794 (2005) 131.
745. T. Lari, *Search for Supersymmetry with early ATLAS data*, presentazione a “Frontier Science 2005”, Milano 12-17 settembre 2005, pubblicato su *Frascati physics Series*, vol. XL (2006) p. 41, ed. A.Pullia e M. Paganoni (2006)
746. T. Lari, *Radiation hardness studies of silicon pixel detectors*, presentazione a “Vertex 2004”, Menaggio (Como), 13-18 settembre 2004, pubblicato su Nucl. Instr. and Meth. A 560 (2006) 93.
747. T. Lari and C. Troncon, *Simulation of Signals in Ultra-Radiation hard silicon pixel detectors*, presentazione al “IEEE Nuclear Science Symposium”, Roma, 16-22 Ottobre 2004, pubblicato su IEEE Trans. on Nucl. Sci. 53 (2006) 2923.
748. T. Lari, *Search for Supersymmetry with early ATLAS data*, presentazione agli “Incontri di Fisica delle Alte Energie”, Pavia, 19-21 Aprile 2006, pubblicata in “IFAE 2006”, ed. Springer-Verlag (2007) p. 207.

# CURRICULUM VITAE DI SILVIA RESCONI

## • STUDI E POSIZIONI

**Posizione attuale:** Ricercatore di III Livello a tempo indeterminato presso l'INFN (Istituto Nazionale di Fisica Nucleare), Sezione di Milano.

Assunzione a tempo indeterminato il 4 maggio 2009. L'attivita' si inserisce nel contesto dell'esperimento ATLAS al Large Hadron Collider (LHC) al CERN di Ginevra.

**Dal 1 febbraio 2000 al 3 maggio 2009: contratti a termine presso l' INFN, Sezione di Milano.**

L'attivita' e' consistita in una collaborazione in qualita' di tecnologo sia per lo studio di sistemi di calcolo distribuito nell'ambito di progetti europei, che per lo sviluppo e test del software di ATLAS.

**Anno accademico 1998/'99:** professore a contratto del corso integrativo "Analisi dati di laboratorio tramite computer ", per il corso di laurea in Scienze Biologiche della facolta' di Scienze dell' Universita' degli Studi di Milano.

**Dal 1 luglio 1998 al 31 dicembre 1998:** contratto al CERN di 6 mesi per attivita' nel gruppo del Software Offline di ATLAS.

**Dal 1 luglio 1996 al 30 giugno 1998:** Borsa di Studio post-laurea bandita dall' INFN della durata di due anni.

**Dal 17 luglio 1995 al 16 luglio 1996:** Borsa di Studio di Perfezionamento all' Estero bandita dall' Universita' di Milano della durata di un anno.  
Luogo di attivita' : CERN (Centro Europeo per la Ricerca Nucleare) a Ginevra.

**Laurea in Fisica** presso l'Università degli Studi di Milano, 28 novembre 1994.

Maturità scientifica con licenza linguistica, luglio 1988, presso il Liceo Scientifico Statale (sperimentazione linguistica) "A. Calini" di Brescia.

- **RESPONSABILITA' E ATTIVITA' DI COORDINAMENTO**

- **Responsabilita' di coordinatore dell'analisi "Mono-photon" nell' ambito del gruppo di analisi "Exotics" di ATLAS (da marzo 2015 a marzo 2017 e a partire da ottobre 2018 fino a oggi).** L'attivita' e' consistita nel coordinare il gruppo di analisi che si occupa di stati finali con un fotone e momento trasverso mancante per la ricerca di materia oscura e nel finalizzare la pubblicazione di due articoli relativi alla presa dati di ATLAS del 2015 e del 2016. L'analisi e' stata ripresa a ottobre del 2018 al fine di fornire i risultati su tutti i dati del Run2.
- **Responsabilita' di coordinatore del sottogruppo "JDM" (Jets and Dark Matter) del gruppo di analisi "Exotics" di ATLAS (da aprile 2017 a marzo 2018).** L'attivita' e' consistita nel coordinare le ricerche di materia oscura e di nuova fisica oltre il Modello Standard caratterizzate da stati finali con alto momento trasverso mancante".
- **Responsabilita' di coordinatore del gruppo "Missing Et" nell' ambito del gruppo di lavoro "Combined Performance Jet/EtMiss" di ATLAS (da ottobre 2011 a ottobre 2012).** L'attivita' e' consistita nel coordinare questo gruppo finalizzato a studi di prestazioni del momento trasverso mancante, "Missing Et", e alla sua ottimizzazione.
- **Responsabilita' di coordinatore della task force "Data Preparation with a view of Missing Et and Jet Measurement" nell'ambito del gruppo di lavoro "Combined Performance Jet/EtMiss" di ATLAS (da ottobre 2008 a ottobre 2011).** L'attivita' e' consistita nel coordinare la task force nata a ottobre 2008 col fine di fornire studi di prestazioni di "Missing Et" e dei jet adronici in vista della presa dati di ATLAS.
- **Responsabilita' del mantenimento del software di ricostruzione del "Missing Et" nell' ambito del RIG (Reconstruction Integration Group) di ATLAS (dal 2000 fino a ottobre 2014),** che ha il compito di fornire all'esperimento il software offline per la ricostruzione e calibrazione.
- **Responsabilita' operativa del Tier2 di ATLAS a Milano (dal 2005 al 2009),** che fornisce potenza di calcolo e spazio disco sia per le produzioni distribuite che per l'analisi e simulazione di dati degli utenti locali.

- **ATTIVITA' EDITORIALI**

Oltre a essere firmataria di piu' di 700 pubblicazioni, ho svolto il ruolo di "Editor" dei seguenti articoli e note pubbliche di ATLAS:

- **"Discovery Potential of  $h/A/H \rightarrow \tau\tau$ ",** PHYS-PUB-2009-059, The ATLAS Collaboration.
- **"Performance of the missing transverse energy reconstruction in proton-proton collisions at center-of-mass energy of 7 TeV with the ATLAS detector",** ATLAS-CONF-2010-039, The ATLAS Collaboration.

- “**Reconstruction and Calibration of Missing Transverse Energy and Performance in Z and W events in ATLAS Proton-Proton Collisions at  $\sqrt{s}=7$  TeV**”, ATLAS-CONF-2012-101, The ATLAS Collaboration.
- “**Performance of Missing Transverse Momentum Reconstruction in Proton-Proton Collisions at 7 TeV with ATLAS**” G. Aad *et al.* [ATLAS Collaboration], 10.1140/epjc/s10052-011-1844-6, Eur. Phys. J. C **72**, 1844 (2012), arXiv:1108.5602 [hep-ex].
- “**Performance of missing transverse momentum reconstruction in ATLAS studied in proton-proton collisions recorded in 2012 at  $\sqrt{s} = 8$  TeV**”, ATLAS-CONF-2013-082, the ATLAS Collaboration.
- “**Pileup Subtraction and Suppression for Missing ET**”, ATLAS-CONF-2014-019, the ATLAS Collaboration.
- “**Performance of missing transverse momentum reconstruction for the ATLAS detector in the first proton-proton collisions at  $\sqrt{s} = 13$  TeV**”, ATL-PHYS-PUB-2015-027, the ATLAS Collaboration.
- “**Search for new phenomena in events with a photon and missing transverse momentum in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector**”, M. Aaboud *et al.* [ATLAS Collaboration], JHEP 06 (2016) 059, arXiv:1604.01306 [hep-ex].
- “**Search for dark matter at  $\sqrt{s} = 13$  in final states containing an energetic photon and large missing transverse momentum with the ATLAS detector**”, M. Aaboud *et al.* [ATLAS Collaboration], European Physical Journal C 77 (2017) 393, arXiv:1704.03848 [hep-ex].
- “**Prospects for dark matter searches in mono-photon and in VBF plus missing transverse momentum final states**”, ATL-PHYS-PUB-2018-038, the ATLAS Collaboration.

- **PRESENTAZIONI A CONFERENZE E SCUOLE INTERNAZIONALI**

- “**The Dark Side of the Universe**”, International School of Space Science, L’Aquila, June 18-22, 2018.
- “**Dark Matter in ATLAS**”, Rencontres de Moriond QCD and High Energy Interactions, La Thuile, March 19-26, 2016.
- “**Jets and missing transverse energy reconstruction, calibration and performance measurements with the ATLAS detector at the LHC**”, CHEF2013 Conference, Paris, April 2013.
- “**Jet and MissingET commissioning in ATLAS**”, (2009)034, Evian, Nov 2009 (ref. C33, 45).

- **PARTECIPAZIONE A EVENTI DI TERZA MISSIONE E ATTIVITA’ DIDATTICA**

- Partecipazione al progetto **Art and Science across Italy**, edizione 2018-2020, organizzato dall’INFN.  
<https://web.infn.it/artandscience/index.php/>

- **Partecipazione alle Masterclass** organizzate presso la Sezione INFN di Milano.  
<https://agenda.infn.it/conferenceDisplay.py?confId=14721>
- **Attività di relatore di varie tesi di laurea e di tutore di tesi di dottorato**

Milano, 26 Febbraio 2019

Silvia Resconi

# Curriculum vitæ of Giancarlo Ferrera

## Researcher unique identifiers

ORCID 0000-0002-4559-0740; Inspire ID INSPIRE-00176935;  
Scopus Author ID 14057930700.

## Current and Previous Positions and Fellowships

- 2018-now Associate Professor (permanent) at Physics Department, Milan University.  
2015-now INFN Scientific Research Appointment.  
2014-now Visiting Scientist at CERN.  
2013 & 2017 Italian Professorship Qualification as Associate (2013) and Full (2017) Professor in the field “Theoretical Physics of Fundamental Interactions”.  
2011-2017 Assistant Professor (permanent) at Physics Department, Milan University.  
2011 Academic Visitor, Physics Department, Zurich University.  
2007-2011 Postdoc position, Physics Department, Florence University.  
2007 Research Training grant (High Energy Physics LatinAmerican-European Network), Buenos Aires University. Supervisor: Prof. D. de Florian.  
2006-2007 Postdoc position at Department E.C.M., Barcelona University. Early Stage Researcher (Marie Curie RTN HEPTOOLS). Supervisors: Prof. F. del Águila, Prof. J. Solà (7 months).

## Education

- 2004-2006 Ph.D. in Physics, Rome University “La Sapienza”. Thesis Title: *Threshold resummation in heavy flavour physics*; Supervisor: Dr. U. Aglietti. Graduation: 23/01/2007.  
2001-2002 Master in Theoretical Physics, Rome University “La Sapienza” ; Thesis Title: *Associated production of Higgs bosons and charginos in the MSSM at linear colliders*; Supervisors: Prof. G. Martinelli and Dr. B. Mele. Graduation: 25/09/2003. Degree: 110/110 cum laude.  
1999-2000 Master studies of Physics at “Scuola Normale Superiore” Pisa and Pisa University.

## Supervision of postdoctoral fellows, graduate and PhD student

- 2012-now Supervisor of 3 postdoc researchers: M.Villapiana, G.Sborlini, N.Rana, Milan U. and INFN.  
2012-now Co-supervisor of 1 PhD student and referee of 4 PhD thesis in Physics.  
2012-now Supervisor of 12 BSc and 4 Master thesis students in Physics, Milan University.

## Organization of research meetings and research responsibilities

- 2019-now Group convener of *VH* subgroup of the CERN “LHC Higgs Cross Section Working Group” and  
2012-2014 of the “Handbook of LHC Higgs Cross Sections: Higgs properties”.
- 2019 Member of local organizing committee of the Workshop: “Workshop on Photon Physics and Simulation at Hadron Colliders”, INFN-LNF, Frascati (Rome), Italy, June 2019
- 2015-2019 Organizer and Convener of the “QCD session” of the workshop “Linear and Future Colliders”, ECT\* Trento, Italy, September 2015/2017/2019.
- 2010 Member of local organizing committee of the Workshop: “HP2.3rd - High Precision for Hard Processes at the LHC”, Florence U., Italy, September 2010
- 2013-2017 Person in charge for the Theoretical Physics Seminars of the Phys. Dept., Milan U.

## Academic teaching and responsibilities

Since 2012 around half of my activity has been devoted to academic teaching and other institutional duties (see below). In case of successfully ERC grant application this activity will be sensibly reduced in order to fullfill the goals of the research project.

- 2012-now Classes of “Quantum Mechanics” (~500h) and “Fundamental Interactions” (~100h), Examination committee “Theoretical Physics” (~100 oral exams)
- 2015-now Lectures “Introduction of perturbative QCD” (20h), PhD School, Milan U. (2015, 2016 and 2017). Lectures to graduate and PhD students “NNLO QCD calculations in hadronic collisions” (12h), Saha Theory Workshop: Multi-loop and Multi-leg processes for precision physics at the LHC, Kolkata (2016)
- 2004-2007 Exercise Classes of “Quantum Mechanics” (30h) and “Mathematical Analysis” (120h)
- 2012-now Committe member of: Bsc/Master theses (~30 times), postdoc/teaching fellowship (10 times), Milan U. PhD School selection (3 times).
- 2012-now Member of the Faculty Committee and person in charge for the Courses of the Theoretical Physics Area of the *Physics, Astrophysics and Applied Physics PhD School* of the Milan U.

## Programming skills

Author and co-author of various numerical codes intensively used by the LHC experimental collaborations: **DYNNLO**, **2 $\gamma$ NNLO**, **HVNNLO**, **HqT**, **DYqT**, **HRes**, **DYres**.

## Participation in funded Network and Research Project

### EU Research Projects:

- 2014-2018: ITN - *The Higgs quest - exploring electroweak symmetry breaking at the LHC (HIGGSTOOLS)*; 3 738 154 € (amount), 4 years (period), project participant (role).
- 2014-2018: ITN - *Advanced Particle Phenomenology in the LHC era (LHCPhenonet)*; 4 491 085 € (amount), 4 years (period), project participant (role).

### Italian Ministry of University and Research Research (MIUR) Projects:

- 2013-2016: *Symmetries, Masses and Mysteries: Electroweak symmetry breaking, flavour mixing and CP violation and Dark Matter in the LHC era*; 920 500 € (amount), 3 years (period), project participant (role).

2009-2011: *Theory of fundamental interactions in the LHC era: precision calculations and new physics.*; 173 793 € (amount), 2 years (period), project participant (role).

2007-2009: *Beyond the Standard Model Physics in the LHC era*; 169 500 € (amount), 2 years (period), project participant (role).

#### **Italian Ministry of Foreign Affairs and International Cooperation (MAECl) Projects:**

2017-2019: *Joint research project for indo-italian scientific cooperation*, project participant (role).

#### **INFN Research Projects:**

2004-2011: *Field Theory of Fundamental Interactions*, project participant (role).

2011-2016: *Weak and Strong Interactions Phenomenology*, project participant (role).

2017-2019: *Phenomenology of Weak and Strong Interactions*, project participant (role).

### **All ongoing grants and funding of the PI (Funding ID)**

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euro)</i>	<i>Period</i>	<i>Role of the PI</i>
Proton strucure for discovery at the Large Hadron Collider	ERC	1 602 862	2017-2022 (5 years)	Project participant
Phenomenology of Weak and Strong Interactions (SPIF)	INFN	~80 000	2017-2019 (3 years)	Project participant
Joint research project of scientific cooperation	MAECl	~20 000	2017-2019 (3 years)	Project participant

### **Other funded grants as PI**

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euro)</i>	<i>Period</i>	<i>Role of the PI</i>
Transition Grant (for reaching II step in ERC-StG)	Milan University	80 000	2017-2019 (2 years)	Project PI
Towards a competitive ERC project in High-Energy Physics	Cariplo Foundation & Regione Lombardia	131 368	2015-2017 (2 years)	Project PI
GPU computing in Theoretical Physics	Milan University	~35 000	2014-2018 (5 years)	Project PI

## **Publications**

### **Representative publications**

- [1] S. Catani, L. Cieri, G. Ferrera, D. de Florian and M. Grazzini, “*Vector boson production at hadron colliders: a fully exclusive QCD calculation at NNLO*”, Phys. Rev. Lett. **103** (2009) 082001.
- [2] D. de Florian, G. Ferrera, M. Grazzini and D. Tommasini, “*Transverse-momentum resummation: Higgs boson production at the Tevatron and the LHC*”, JHEP **1111** (2011) 064.
- [3] G. Ferrera, M. Grazzini and F. Tramontano, “*Associated WH production at hadron colliders: a fully exclusive QCD calculation at NNLO*”, Phys. Rev. Lett. **107** (2011) 152003.
- [4] G. Bozzi, S. Catani, G. Ferrera, D. de Florian and M. Grazzini, “*Production of Drell-Yan lepton pairs in hadron collisions: transverse-momentum resummation at next-to-next-to-leading logarithmic accuracy*”, Phys. Lett. **B696** (2011) 207.
- [5] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, “*Diphoton production at hadron colliders: a fully-differential QCD calculation at NNLO*”, Phys. Rev. Lett. **108** (2012) 072001.

- [6] D. de Florian, G. Ferrera, M. Grazzini and D. Tommasini, “*Higgs boson production at the LHC: transverse momentum resummation effects in the  $H \rightarrow 2\gamma$ ,  $H \rightarrow WW \rightarrow ll\nu\nu$  and  $H \rightarrow ZZ \rightarrow 4l$  decay modes*”, JHEP **1206** (2012) 132.
- [7] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, “*Universality of transverse-momentum resummation and hard factors at the NNLO*”, Nucl. Phys. B **881** (2014) 414.
- [8] G. Ferrera, G. Somogyi and F. Tramontano, “*Associated production of a Higgs boson decaying into bottom quarks at the LHC in full NNLO QCD*,” Phys. Lett. B **780** (2018) 346.
- [9] G. Ferrera and J. Pires, “*Transverse-momentum resummation for Higgs boson pair production at the LHC with top-quark mass effects*,” JHEP **1702** (2017) 139.
- [10] L. Cieri, G. Ferrera and G. F. R. Sborlini, “*Combining QED and QCD transverse-momentum resummation for Z boson production at hadron colliders*,” JHEP **1808** (2018) 165.

### Other publications on peer-reviewed Journal Papers

- [11] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, JHEP **1804** (2018) 142
- [12] S. Alioli *et al.*, Eur. Phys. J. C **77** (2017) no.5, 280
- [13] S. Catani, D. de Florian, G. Ferrera and M. Grazzini, JHEP **1512** (2015) 047.
- [14] R. Angeles-Martinez *et al.*, Acta Phys. Polon. B **46** (2015) no.12, 2501
- [15] S. Forte *et al.*, Eur. Phys. J. C **75** (2015) no.11, 554
- [16] G. Ferrera, M. Grazzini and F. Tramontano, Phys. Lett. B **740** (2015) 51
- [17] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, Nucl. Phys. B **888** (2014) 75
- [18] G. Ferrera, M. Grazzini and F. Tramontano, JHEP **1404** (2014) 039.
- [19] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, Eur. Phys. J. C **72** (2012) 1.
- [20] S. Catani, G. Ferrera and M. Grazzini, JHEP **1005** (2010) 006
- [21] G. Bozzi, S. Catani, D. de Florian, G. Ferrera, M. Grazzini Nucl. Phys. B **815** (2009) 174.
- [22] U. Aglietti, L. Di Giustino, G. Ferrera and L. Trentadue, Phys. Lett. B **670** (2009) 367
- [23] U. Aglietti, F. Di Lodovico, G. Ferrera and G. Ricciardi, Eur. Phys. J. C **59** (2009) 831
- [24] G. Ferrera, J. Guasch, D. Lopez-Val and J. Sola, Phys. Lett. B **659** (2008) 297
- [25] G. Ferrera, Nuovo Cim. B **123** (2008) 766.
- [26] G. Corcella and G. Ferrera, JHEP **0712** (2007) 029.
- [27] U. Aglietti, G. Ferrera and G. Ricciardi, Nucl. Phys. B **768** (2007) 85.
- [28] U. Aglietti, G. Corcella and G. Ferrera, Nucl. Phys. B **775** (2007) 162.
- [29] U. Aglietti, L. Di Giustino, G. Ferrera, and L. Trentadue, Phys. Lett. B **651** (2007) 275
- [30] U. Aglietti, L. Di Giustino, G. Ferrera, A. Renzaglia, G. Ricciardi and L. Trentadue, Phys. Lett. B **653** (2007) 38
- [31] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034006.
- [32] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034005.
- [33] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034004.
- [34] G. Ferrera and B. Mele, Eur. Phys. J. C **42** (2005) 425.

### Other publications

- [35] M. L. Mangano *et al.*, “*Physics at a 100 TeV pp Collider: Standard Model Processes*,” CERN Yellow Report (2017) no.3, 1
- [36] A. Andreazza *et al.*, “*What Next: White Paper of the INFN-CSN1*,” Frascati Phys. Ser. **60** (2015) 1.
- [37] D. de Florian *et al.* “*Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector*,”
- [38] G. Ferrera, “*Standard Model physics at the LHC*,” Nuovo Cim. C **38** (2015) no.1, 9.
- [39] G. Ferrera and L. Trentadue “*Perturbative QCD at the LHC*”, Nuovo Cim. C **37** (2014) 83.
- [40] S. Heinemeyer *et al.* “*Handbook of LHC Higgs Cross Sections: 3. Higgs Properties*”.
- [41] S. Dittmaier, *et al.*, “*Handbook of LHC Higgs Cross Sections: 2. Differential Distributions*”.
- [42] J. M. Campbell *et al.*, “*Report of the Snowmass 2013 energy frontier QCD working group*”.

## Citesummary from INSPIRE (01/2019)

Number of citations attracted by all the citable papers (2005-2018):

5300 (all 56 papers, average cit. 96); 2600 (34 published papers, average cit. 77); 2100 (34 publ. papers excluding self cites, average cit. 63).

Number of citations attracted by the citable papers of the last 10 years (2009-2018):

5000 (all 38 papers, average cit. 132); 2300 (21 published papers, average cit. 108); 2000 (21 publ. papers excluding self cites, average cit. 93);

## Selected invited presentations to international established conferences and workshops (among more than 60 seminars)

- [1] *Precise perturbative QCD predictions for the LHC: higher-order calculations and all-order Sudakov resummation*, 48th International Symposium on Multiparticle Dynamics Singapore, 2018.
- [2] *Future Hadron Collider Theory*, 6th Annual LHC Physics Conference (LHCP2018), Shanghai, China, 2018.
- [3] *Transverse-momentum resummation for vector boson production* ATLAS Standard Model Workshop, Thessaloniki, Greece, 2017.
- [4] *NNLO QCD predictions and transverse-momentum resummation for vector boson production* (LHCP2017), 4th Annual LHC Physics Conference, Shanghai, China, 2017.
- [5] *Vector boson production at the LHC: transverse-momentum resummation and leptonic decay*, 3th Annual LHC Physics Conference (LHCP2015), St. Petersburg, Russia, 2015.
- [6] *Diphoton production at hadron colliders in NNLO QCD*, “Loops and Legs in Quantum Field Theory” 11th DESY Workshop on Elementary Particle Physics, Wernigerode, Germany, 2012.
- [7] *Higher-order QCD effects for associated VH production and decay at the LHC*, “XLVIIth Rencontres de Moriond” QCD and High Energy Interaction, La Thuile, Italy, 2012.
- [8] *VH Cross Section Working Group: Theory status and plans*, “VII LHC Higgs Cross Section Workshop”, CERN, Switzerland, 2012.
- [9] *Lepton Charge Asymmetry from W decays at hadron colliders in NNLO QCD*, “XLIVth Rencontres de Moriond” La Thuile, Italy, 2010.
- [10] *NNLO QCD corrections to lepton charge asymmetry in W decays at hadron colliders*, XVIII Int. Workshop on DIS and Related Subjects, Florence, Italy, 2010.
- [11] *Fully differential NNLO QCD calculations for WH production at hadron colliders*, 11th Int. Symp. on Radiative Corrections, Mamallapuram, India, 2009.
- [12] *Higher-order QCD corrections to vector boson production at hadron colliders*, Europhysics Conf. on High Energy Physics, Krackow, Poland, 2009.
- [13] *NNLO QCD correction to vector boson production at hadron colliders*, 9th International Symposium on Radiative Corrections, Ascona, Switzerland, 2009.
- [14] *Higher-order QCD corrections for vector boson production at hadron colliders*, “XLIIIth Rencontres de Moriond” La Thuile, Italy, 2009.
- [15] *Triple Higgs boson production at the ILC within a generic Two-Higgs-Doublet Model*, 8th Intern. Symposium on Radiative Corrections, Florence, Italy, 2007.

Milan, 26/2/2019

# CURRICULUM VITAE di MAURO CITTERIO

## Esperienza lavorativa

- *Gen. 2009 – presente* Dirigente Tecnologo dell’Istituto Nazionale di Fisica Nucleare
- *Dic. 2003 – Dic. 2008* Primo Tecnologo dell’Istituto Nazionale di Fisica Nucleare
- *Sett. 1999 – Dic. 2003* Tecnologo dell’Istituto Nazionale di Fisica Nucleare
- *Ott. 1993 – Sett. 1999* Associate Physicist presso la “Instrumentation Division” del Brookhaven National Laboratory, Upton, NY, USA.
- *Gen. 1991 – Sett. 1993* Assistant Physicist presso la “Instrumentation Division” del Brookhaven National Laboratory, Upton, NY, USA.

## Capacità e competenze professionali

Progettazione e caratterizzazione di elettronica analogica integrata e discreta.  
Conoscenze in varie tecnologie elettroniche avanzate.  
Preparazione teorica nell’ambito delle tecniche di elaborazione analogica del segnale.  
Esperienza nella realizzazione e caratterizzazione di elettronica a basso rumore e sistemi di acquisizione per esperimenti di fisica nucleare e delle alte energie (esperimenti ATLAS ed LHCb al CERN, Ginevra)  
Attività di ricerca documentata da oltre 100 pubblicazioni su riviste internazionali e partecipazioni a conferenze.

## Responsabilità

- |                       |   |
|-----------------------|---|
| Giu. 2002 - presente  | Responsabile del Servizio di Elettronica della Sezione INFN di Milano.  |
| Gen. 2003 – Gen 2007  | ATLAS LAr Electronics Coordinator (CERN).   |
| Apr. 2002 – Gen 2003  | ATLAS LAr Installation Coordinator (CERN)   |
| Gen. 2001 – Gen 2002  | ATLAS LAr Installation Task Force Chairman (CERN)   |
| Apr. 2000 – Gen. 2003 | ATLAS LAr Deputy Electronics Coordinator (CERN)   |
| Ott. 1993 – Set. 1999 | Responsabile della produzione del preamplificatore di front-end per conto della “US ATLAS LAr Collaboration” (USA). |

## Attività di Insegnamento

- |                       |  |
|-----------------------|--|
| Ott. 2002 – presente  | Professore a contratto - Universita’ degli Studi di Milano per il Corso: “Elettronica dei sistemi digitali”, Dipartimento di Fisica  |
| Ott. 2012 – presente  | Professore a contratto - Universita’ degli Studi di Milano per il Corso: “Laboratorio di Strumentazione per i Rivelatori di Particelle”, Dipartimento di Fisica                            |
| Ott. 2000 – Set. 2004 | Professore a contratto - Universita’ degli Studi di Milano per il Corso: “Complementi di Strumentazione Analogica”, Scuola di Specializzazione in Fisica Sanitaria Dipartimento di Fisica. |
| Ott. 1999 – Set. 2002 | Professore a contratto - Universita’ degli Studi di Milano per il Corso: “Esercitazioni di Elettronica Nucleare”, Dipartimento di Fisica.  |