

Contalbrigo Marco ^a

EDUCATION:

- 2001 **PhD in Physics**
at Ferrara University
Thesis: *Precise measurement of the $K_L \rightarrow \pi^0\gamma\gamma$ decay*
Supervisor: prof. Pietro Dalpiaz. Experiment: NA48 (CERN)
- 1996 **Degree in Physics**
at Padova University (evaluation of 110 over 110 cum laude)
Thesis: *Search of tau neutrinos in the CERN SPS neutrino beam*
Supervisor: prof. Milla Baldo-Ceolin. Experiment: NOMAD (CERN)
- 2001-05 **Post-doc fellowship** at Ferrara University:
Calibration and analysis of a polarized atomic target.
- 2001 **Post-doc fellowship** at Perugia University:
Study of direct CP violation in the K_L decay and rare K_S decays.

RESEARCH RESPONSIBILITIES:

- 2005- **INFN Researcher** INFN - Sezione di Ferrara
- 2006-12 **Coordinator** of the Nuclear Physics Group of INFN-Ferrara
- 2018- **INFN National Responsible** of the JLab12 experiment
- 2019- **INFN Local Responsible** of the EIC experiment
- 2009- **INFN Local Responsible** of the JLab12 experiment
- 2008-09 **INFN Local Responsible** of the HERMES experiment
- 2013- **Responsible** of the Particle Detector Laboratory of INFN-Ferrara
- 2014- **Coordinator** of the national priority project CLASMED
- 2019- **Activity Leader** within the European Program STRONG2020
- 2012-14 **Activity Leader** within the European Program HP3
- 2016- **Member** of the CLAS Coordinating Committee
- 2013- **Contact person** of the CLAS12 Run-Group of experiments H
- 2011- **Co-spokesperson** of the C12-11-111 experiment at JLab (conditionally approved)
- 2009- **Co-spokesperson** of the E-09-008 experiment at JLab
- 2010-13 **Deputy Spokesperson** of the HERMES experiment
- 2016- **Chair** Deep Process Working Group (CLAS)
- 2010-13 **Analysis Coordinator** of the HERMES experiment
- 2008-13 **Editorial Board Member** of the HERMES experiment
- 2008-12 **Convener** of physics with transverse polarization (HERMES)
- 2003-06 **Convener** of physics of inclusive processes (HERMES)
- 2013- **Co-responsible** CLAS12 RICH
- 2018- **Co-responsible** mRICH, dRICH and readout electronics for the EIC PID Consortium
- 2006-10 **Vice-responsible** of the PAX detector
- 2000-02 **Responsible** beam monitor NA48

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ADVISORY AND DISSEMINATION ACTIVITY:

- 2020- **Member** of the CERN SPSC
2016-2018 **Member** of JLab User Group Board of Directors
- 1997- **Author** of more than 220 published papers
2012- **Peer-reviewer** for Phys. Rev. B, Eur. Phys. J. A and Nucl. Instrum. & Meth. A
- 1999- **Speaker** at more than 50 Conferences on scientific and technological topics
2015- **Member** of International Advisory Committee of POETIC Conference
2008- **Editor** of 5 Conference Proceedings
2002- **Member** of the Organizing Committee of more than 14 Conferences
2016 **Convener** of the "3D Structure of the Nucleon: TMDs" session at SPIN Conference
2013 **Convener** of the "Spin Physics" session at DIS Conference

RESEARCH ACTIVITY

Marco Contalbrigo is Researcher of INFN - Sezione di Ferrara.

He is interested in Electro-Weak and Hadronic Physics and has contributed to several experiments having personal and coordinating responsibilities relative to all the experimental phases: detector project and feasibility study, development and commissioning, signal calibration and event reconstruction algorithms, data analysis and interpretation, publication and dissemination.

He worked on Electro-Weak Physics topics of cosmological interest contributing to precision measurements with discovery potential. With the NOMAD experiment, he contributed to the search of neutrino oscillations in the mass range of large Δm^2 , studying their potential role in the Universe evolution and dark matter formation. With the NA48 experiment, he studied the CP violation in the kaon sector, looking for an explanation of the matter-antimatter asymmetry of the visible Universe.

He concentrates his activity on Hadronic and Spin Physics, i.e. strong interaction processes and dynamics. The modern precision measurements, even in the electro-weak sector, are often limited by the uncertainties on the nuclear and hadronic contributions. In this field the experimental situation, after several years of almost stagnation, has begun a rapid evolution, aiming to the explanation of long-standing questions on the nucleon structure (spin puzzle, single-spin asymmetries, proton form-factors) and opening new ways of investigation of the peculiar strong force dynamics. Moreover, Spin Physics experiments offer technological challenges for the development and maintenance of polarized beams and targets which require R&D of innovative techniques.

As Coordinator of the Nuclear Physics Group of INFN - Sezione di Ferrara, he has promoted the extension of the group activity, initially concentrated on HERMES experiment, to other projects: JLab12, PAX/JEDI and EIC. He promotes status-of-the-art laboratories in Ferrara (polarized target, cryogenics, silicon detectors, Cherenkov detectors). He is contributing to new experimental proposals on Hadronic and Spin Physics.

He contributed to the HERMES investigation of nucleon spin-structure, to the measurement of the quark-spin component and to the three-dimensional study of non-collinear dynamics and novel parton distributions related to partonic spin-orbit effects. He has led with several responsible positions the activity of such a precursor experiment, that has published several first-observations and has contributed to open a new avenue of research in QCD still under intense experimental and theoretical activity.

He participates to the PAX/JEDI program for the fine control and manipulation of the spin in accumulation rings in conjunction with polarised targets. Possible applications are the use of

antiproton polarized beams for unique measurements of new parton distributions and time-like phases of the proton form factors, and precision measurements of the spin precession to verify fundamental symmetries as time invariance and electric dipole moment of particles.

He has promoted the Spin Physics program for the 12 GeV JLab upgrade. He has contributed to several approved experimental proposals for the precise study of the spin effects and novel parton distributions in the valence region with high luminosity and complementary spectrometers. He is leading the project of a ring-imaging Cherenkov detector for hadron identification in CLAS12 (experimental Hall-B) in the 3 to 8 GeV/c hadron momentum range. He is contributing to the development of innovative polarized targets, to minimize the dilution of non-polarisable materials and the acceptance limitations due to the holding magnetic fields.

He promotes the realization of an Electron-Ion Collider (EIC) of high luminosity and polarization to study the strong force dynamics in confined states and in particular nucleon 3D structure, spin-orbit and short-range correlations, parton propagation in cold nuclear matter, gluon condensate.

He contributes to the R&D activity on new technologies on polarized targets and beams and on particle detectors with potential applications for other fields (alternative energy, medical imaging, homeland security).

Ferrara, 06/08/2021

Marco Contalbrigo

