Curriculum Vitæ of AD Polosa

Name: Antonio Davide Polosa
Nationality: Italian
Spoken Languages: English, French

Education and Academic Appointments

- July 96 - University graduation in Physics, cum Laude, (Univ. of Bari, Italy)
- Dec. 97 - Nov. 99: Visiting graduate student under Prof R. Gatto (Univ. of Geneva, Switzerland)
- Oct. 99 - Discussion of PhD thesis, (Univ. of Bari, Italy)
- Dec. 99 - Nov 01: Post-Doc (Univ. of Helsinki, Finland)
- Dec. 01 - Nov. 03: Post-Doc (CERN - Theory Division, Switzerland)
- Dec. 03 - Jun. 04: Post-Doc (LAPP - Theory - Annecy, France)
- Jun. 04 - Oct. 04 : Post-Doc (Centro E. Fermi, Roma, Italy)
- Nov. 04 - Nov. 05: `Rientro Cervelli' Grant (Univ. of Bari, Italy)
- Dec. 05 - Dec. 10: INFN-Researcher, Rome
- Jun. 07 - Jul. 07: Visiting Fellowship, MIT, Boston (USA)
- Dec. 07 - Feb. 07: CERN Scientific Associate
- May. 08 - Jun. 08: Visiting Fellowship (HELEN network), University of Buenos Aires (Argentina)
- Jan. 10 - Feb. 10: Visiting, CALTECH, Pasadena (USA)
- Jul. 10: Associate Professor Habilitation, Politecnico di Torino
- Dec. 10: Associate Professor, Department of Physics, Sapienza University of Rome
- Jan. 14: National Scientific Habilitation to Full Professor
- Jan. 16 - Sept. 16: CERN Scientific Associate

Scientific Committees

- Nov. 14: Appointed member of European Committee for Future Accelerators (ECFA)
- May 17: Appointed member of Consiglio Scientifico Laboratori Nazionali di Frascati LNF-INFN.

Research Activities

There follows a schematic description of my research activity organized by topics, not strictly in chronological order.

— *Heavy meson physics (Quark models for exclusive decays of B and D mesons)*

We introduced an effective heavy meson lagrangian for S- and P- wave heavy-light mesons, based on meson-quark interactions, where transition amplitudes are represented by diagrams with heavy mesons attached to loops containing heavy and light constituent quarks. The resulting model is relativistic and incorporates the heavy quark symmetries. Several applications of the model, later named CQM, to strong and radiative decays of D and B mesons were considered, with good agreement with data. The method developed was used as a tool to solve problems in heavy ion physics and hadron spectroscopy. A summary of early work done with it can be found in the review quoted below.

— Constituent quark-meson model for heavy meson processes — with A. Deandrea, N. Di Bartolomeo, R. Gatto, G. Nardulli — **Phys Rev D58 (1998) 034004**

— Semileptonic B —> rho and B—> a1 transitions in a quark-meson meodel — with A. Deandrea, R. Gatto, G. Nardulli — **Phys Rev D59 (1999) 074012**

— The CQM model — ADP — **Riv Nuovo Cim. 23 N11 (2000) 1**

— *The physics of light scalar mesons*

One of my first papers on light scalar mesons concerns the contribution of the *σ(500)* in quasi–two–body *B* decays via a *ρ* meson. In particular, its potential relevance to the measurement of CP violations (*α*-angle) was considered.

The line of research on scalar mesons changed direction after the discovery of the light pentaquarks and the proposal of Wilczek and Jaffe to use diquarks to explain the pentaquark phenomenology. We found that also light scalar mesons fit rather well a diquark-antidiquark description. The resulting nonet obeys mass formulae which respect, to a good extent, the OZI rule. Strong decays are well reproduced by a single amplitude describing the switch of a q-anti-q pair, which transforms the state into two colorless pseudoscalar mesons.

Later we discussed the effect of the instanton induced, six-fermion effective Lagrangian on the decays of the lightest scalar mesons in the diquark–antidiquark picture. This addition allows for a remarkably good description of light scalar meson decays. The same effective Lagrangian produces a mixing of the lightest scalars with the positive parity q-anti-q states. A coherent picture of scalar mesons as a mixture of tetraquark states (dominating in the lightest mesons) and heavy q-anti-q states (dominating in the heavier mesons) emerged and is very well known and used.

— Predicting D-> sigma pi — with R. Gatto, G, Nardulli and N. Tornqvist — **Phys Lett B494 (2000) 168-174**

— B → ρπ decays: resonant and non-resonant contributions — with A. Deandrea — **Phys Rev Lett 86 (2001) 216-219**

— The s anti-s and K anti-K nature of f0(980) in Ds decays — with A. Deandrea, R. Gatto, G, Nardulli and N. Tornqvist — **Phys Lett B502 (2001) 79-86**

— A new look at scalar mesons — with L. Maiani, F. Piccinini and V. Riquer — **Phys Rev Lett 93 (2004) 212002**

— A theory of scalar mesons — with G. 't Hooft, G. Isidori, L. Maiani and V. Riquer — **Phys Lett B662 (2008) 424**

— *Monte Carlo methods for hadron collider physics*

ALPGEN is an event generator for the study of multiparton hard processes in hadronic collisions. The code library is dedicated to the calculation, at the leading order in QCD and EW interactions, of the exact matrix elements for a large class of multi-leg parton-level processes of interest in the study of the Tevatron and LHC data. ALPGEN was massively used in the Tevatron physics program as well as in ATLAS and CMS.

The success of ALPGEN is well known and most of the technologies at its core, first of all the alpha-algorithm, are still at the frontier, even though the library was not further developed, especially in its front-end features.

Since 2003 it is still a renowned standard computational tool in collider physics.

The building of the ALPGEN library proceeded through the systematic interfacing of the alpha-algorithm with PDFs and efficient phase-space calculation methods for all the main processes of interest to hadron collider physics. This required the solution of a large number of technical problems to achieve an adequate level of optimization and efficiency.

Although less known, I would like to mention here also our first attempts towards the automatic and fully numerical evaluation of one-loop scattering amplitudes in perturbative quantum field theory. We used suitably formulated dispersion relations (with a diagrammatic approach due to Veltman) to perform the loop calculations as convolutions of tree-level amplitudes. This allowed to take advantage of the iterative numerical algorithms for the calculation of leading order matrix elements in ALPGEN. We presented a fully automatic one-loop calculation of the e+e- → q anti-q gluon process. The program of devising tools for fully numerical loop calculations has not been accomplished to the time being.

— ALPGEN, a generator for hard multiparton processes in hadronic collisions — with M.L. Mangano, M. Moretti, F. Piccinini and R. Pittau — **JHEP037 (2003) 001**

— b anti-b final states in Higgs production via vector boson fusion at the LHC — with M.L. Mangano, M. Moretti, F. Piccinini and R. Pittau — **Phys Lett B556 (2003) 50-60**

— Monte Carlo studies of the jet activity in Higgs + 2jets events — with V. Del Duca, G. Klamke, D. Zeppenfeld, M.L. Mangano, M. Moretti, F. Piccinini and R. Pittau — **JHEP0610 (2006) 016**

— A fully numerical approach to one-loop amplitudes — with M. Moretti and F. Piccinini — **arXiv: 0802.4171**

— *LHC phenomenology: THDM and Supersymmetry*

Studying the two-Higgs-doublet models (THDM) in the decoupling limit revealed the existence of parameter configurations with a large triple-Higgs self-coupling as the main low-energy trace of any departure from a Standard Model Higgs sector. We considered the case of an intermediate mass Higgs boson, with 120 GeV < M_H < 140 GeV, produced in pairs via vector-boson fusion, Higgs-strahlung and associated production with heavy-quarks and decaying into b-anti-b pairs. We confirmed that the observation of a Higgs-pair signal is challenging in the framework of the SM, even at the LHC with upgraded luminosity.

This kind of work has been made systematic in what nowadays is known as the effective theory approach to the search of new physics at the LHC.

After the discovery of the Higgs boson, we used the available experimental information on the Higgs particle observed at 125 GeV to derive the mass of the heavier Higgs partners predicted by Minimal Supersymmetry. We demonstrated that the value Mh ≈ 125 GeV fixes the dominant radiative corrections that enter the MSSM Higgs boson masses, leading to a Higgs sector that can be described, to a good approximation, by only two free parameters. In a second step, we considered the direct supersymmetric radiative corrections and showed that, to a good approximation, the phenomenology of the lighter Higgs state can be described by its mass and three couplings: those to massive gauge bosons and to top and bottom quarks. This approach goes nowadays under the name of *hMSSM* and belongs to the standard set of models considered in the analyses of the ATLAS and partly of the CMS collaboration.

— Higgs boson self-couplings at the LHC as a probe of extended Higgs sectors — with M. Moretti, S. Moretti, F. Piccinini and R. Pittau — **JHEP02 (2005) 024**

— Probing Minimal Supersymmetry at the LHC with the Higgs boson mass — with L. Maiani and V. Riquer — **New J. of Physics 14 (2012) 073029**

— Bounds to the Higgs sector masses in minimal supersymmetry from LHC data — with L. Maiani and V. Riquer — **Phys Lett B724 (2013) 274-277**

— The post-Higgs MSSM scenario — with A. Djouadi, L. Maiani, G. Moreau, J. Quevillon and V. Riquer — **Eur. Phys. J. C74 B724 (2014) 2843**

— Fully covering the MSSM Higgs sector at the LHC — with A. Djouadi, L. Maiani, J. Quevillon and V. Riquer — **JHEP 1506 (2015) 168**

— *Heavy ion physics*

Following the CERN announcement of the *J/ψ* suppression in NA50 data, I decided to check that signal against the background of absorption due to the pion gas produced in central lead-lead collisions. We made use of the CQM model (mentioned in the *Heavy Meson Physics* section above) to estimate the *J/ψ* - pion couplings. We assumed the *J/ψ* to be produced inside a thermalized pion gas, as discussed by Bjorken, and introduced the corrections due to nuclear matter absorption as well. Our analysis lended support to the observation of an unconfined quark–gluon phase.

Later, with RHIC data, we presented general arguments, based on medium-induced radiative energy loss, which reproduced the non-gaussian shapes of away-side di-jet azimuthal correlations found in nucleus-nucleus collisions. A generalization of the Sudakov form factors to opaque media allowing an effective description of the experimental data was proposed.

We returned to heavy ion physics after the observation at ALICE of light nuclei in low transverse momentum reactions. In particular we extrapolated the yield of low *pT* deuteron (observed in pp collisions) in the *pT*~15 GeV region to make a comparison with the X(3872), possibly a loosely bound molecule as the deuteron, which instead shows a large production cross section in the high transverse momentum region, as observed by CMS. This has important consequences to asses the nature of the X and, in general, represents the main obstacle to the hadron molecule picture.

— J/psi couplings to charmed resonances and to pions — with A. Deandrea and G. Nardulli — **Phys Rev D68 (2003) 034002**

— J/psi absorption in heavy ion collisions I,II — with L. Maiani, F. Piccinini and V. Riquer — **Nucl Phys A741 (2004) 273 and A748 (2005) 209**

— Counting valence quarks at RHIC and LHC — with L. Maiani, V. Riquer, C. Salgado — **Phys Lett B645 (2007) 138**

— Jet shapes in opaque media — with C. Salgado — **Phys Rev C75 (2007) 041901**

— Observation of light nuclei at ALICE and the X(3872) conundrum — with A. Esposito, A. Guerrieri, L. Maiani, F. Piccinini, A. Pilloni — **Phys Rev D92 (2015) 034028**

— *Exotic Hadron Spectroscopy: Tetraquarks and Pentaquarks*

We introduced the idea of heavy-light diquarks, with properties dictated by heavy quark-symmetries, and showed that they could be the building blocks of a rich spectrum of states which can accommodate some of the newly observed charmonium-like resonances not fitting a pure c-anti-c assignment. We examined this possibility for hidden and open charm diquark-antidiquark states deducing spectra from constituent quark masses and spin-spin interactions. This approach had a broad number of consequences in the field of model building devoted to the understanding of XYZ resonances. I have to underscore that this was the only approach predicting the existence of charged narrow resonances decaying into J/ψ+charged pions/rhos' final states, a fact which has been much later confirmed by LHCb (after some early indications from Belle). This was also the clearest way to predict and understand heavy pentaquarks, later discovered at LHCb, and to anticipate the possible existence of doubly charmed/beauty tetraquarks, a topic which is receiving renovated attention in experimental physics.

Data have been rapidly growing over the last decade with the confirmation of more than 20 resonances with strong exotic features. The compact tetraquark model, in the diquark-antidiquark realization, has been challenged over the years by a number of new phenomenological questions that we are in a position to answer.

In particular we are able to show how the description of X and Z resonances in terms of compact tetraquarks made of diquarks is compatible with the non-observation of charged partners $X^{\pm}$ of the X(3872) as well as with the absence of a hyperfine splitting between two different neutral states, originally introduced to explain the isospin violating decay pattern of the X. In the same picture, Z_c and Z_b particles are expected to form complete isospin triplets. It is also explained why the decay rate into final states including quarkonia are suppressed with respect to those having open charm/beauty states.

We have reasons to believe that the phenomenology of X and Z resonances is indicating that there is an effective repulsion between diquarks and antidiquarks at very short distances, within hadrons, whereas they do attract as pointlike sources of color when the distance is increased. If confirmed, this conclusion might have a broader interest, exceeding the perimeter of exotic hadron spectroscopy.

Following a research line initiated by S. Weinberg, on tetraquarks in the 1/N expansion, we found that if one goes beyond the planar order, tetraquark poles could arise in diagrams with handles. We proposed recently a non-planar solution with two fermion loops and one handle, the minimal number of topologies, requiring only one tetraquark species.

All these aspects will be described in a book by Cambridge University Press in preparation.

Tetraquark and Pentaquark models

— Diquark-antidiquarks with hidden or open-charm and the nature of X(3872) — with L. Maiani, F. Piccinini, V. Riquer — **Phys Rev D71 (2005) 014028**

— Four-quark interpretation of Y(4260) — with L. Maiani, F. Piccinini, V. Riquer — **Phys Rev D72 (2005) 031502**

— Four-quark mesons in non-leptonic B decays: could they resolve some old puzzles? — with I. Bigi, L. Maiani, F. Piccinini, V. Riquer — **Phys Rev D72 (2005) 114016**

— Indication of a four-quark structure for the X(3872) and X(3876) particles from Recent Belle and Babar data — with L. Maiani and V. Riquer — **Phys Rev Lett 99 (2007) 182003**
— Exotic hadrons with hidden charm and strangeness — with N. Drenska and R. Faccini — **Phys Rev D79 (2009) 162001**
— Charmed Baryonium — with G. Cotugno, R. Faccini and C. Sabelli — **Phys Rev Lett 104 (2010) 132005**
— A J^PG=1++ charged resonance in the Y(4260) → π+π- J/ψ decay? — with L. Maiani, R. Faccini, V. Riquer, F. Piccinini and A. Pilloni — **Phys Rev D87 (2013) 111102**
— Doubly Charmed tetraquarks in Bc and Ξbc **decays** — with A. Esposito, M. Papinutto, A. Pilloni and N. Tantalo — **Phys Rev D88 (2013) 054029**
— The Z(4430) and a new paradigm for spin-interactions in tetraquarks — with L. Maiani and V. Riquer — **Phys Rev D89 (2014) 114010**
— The new pentaquarks in the diquark model — with L. Maiani and V. Riquer — **Phys Lett B749 (2015) 289**
— Tetraquarks in the 1/N expansion and meson-meson resonances — with L. Maiani and V. Riquer — **JHEP1606 (2016) 160**
— Tetraquarks in the 1/N expansion: a new appraisal — with L. Maiani and V. Riquer — **arXiv: 1803.06883**
— A theory of X and Z resonances — with L. Maiani and V. Riquer — **Phys Lett B778 (2018) 247**

— Book: Mutiquark hadrons — with A. Ali and L. Maiani — **Cambridge University Press** — **in preparation (to be released soon).**

Production of Tetraquark at hadron colliders

The problem of the prompt production of the X resonance at hadron colliders is per-se a topic of investigation for it was clear from the first observations at CDF that it is highly counterintuitive to accept that a loosely bound molecule of open charm mesons could be copiously produced in high *pT* reactions at center of mass energies in the TeV range or higher — this would favor the compact tetraquark interpretation.
We introduced a method to study the production of X resonances in p(anti)p collisions. Our conclusions are still severely challenging all serious attempts to describe the X,Y,Z particles in terms of molecules of color singlet hadrons.
— Is the X(3872) production cross section at Tevatron compatible with a hadron molecule interpretation? — with B. Grinstein, C. Bignamini, F. Piccinini and C. Sabelli — **Phys Rev Lett 103 (2009) 162001 (Editors' Suggestion)**
— A mechanism for hadron molecule production in pp(bar) collisions — with A. Esposito, F. Piccinini and A. Pilloni — **J Mod Phys 4 (2012) 1569**
— Production of tetraquarks at the LHC — with A. Guerrieri, F. Piccinini and A. Pilloni — **Phys Rev D90 (2014) 034003**
— Constraints from precision measurements on the hadron molecule interpretation of X,Y,Z resonances — ADP — **Phys Lett B746 (2015) 248**
— Multiquark resonances — with A. Esposito and A. Pilloni — **Phys Rept 668 (2016) 1**

— *Other topics*

In this section I mention some studies I have undertaken, less systematically, over the time.

These include an early work on the lattice Schrodinger functional (made during my undergraduate thesis), a study of the time series of human blood pressure waves, an initiative I had during my early PhD studies (which had some impact outside the physics community — see the link), two papers on statistical mechanics methods and random matrices, a work on the Landau-Yang theorem in QCD, started by a discussion with L. Del Debbio and M. Cacciari, and some papers on the disproval of low energy nuclear reactions, advocated by some authors as a promising new way for producing clean and sustainable energy.

I also include a paper on a recent dispute on the claim of observation of vacuum birefringence from the polarized light of certain neutron stars having very strong magnetic fields. The interpretation of PVLAS data on light dichroism in vacuum and in presence of magnetic fields is at the core of the paper on millicharged electrons listed below.

— The lattice Schrodinger functional and the background field effective action— with P. Cea and L. Cosmai — **Phys Lett B392 (1997) 177**

— Wavelet analysis in vasovagal syncope — with A. Marrone, G. Scioscia and S. Stramaglia — **Physica A 271 (1999) 458**

See the comment appeared on The Guerdian UK
https://www.theguardian.com/science/2000/jan/27/technology1?CMP=Share_iOSApp_Other

— Magnetic order in the Ising model with parallel dynamics — with E.N.M Cirillo and F.R. Nardi— **Phys Rev E64 (2001) 057103**

— Observation potential of the etab at the Fermilab Tevatron — with F. Maltoni — **Phys Rev D70 (2004) 054014**

— New bounds on millicharged particles from cosmology — with A. Melchiorri and A. Strumia — **Phys Lett B650 (2007) 416**

— A note on large N scalar QCD(2) — with B. Grinstein and R. Jora— **Phys Lett B671 (2009) 440**

— The Delta-statistics of unconventional quarkonium-like resonances — with E.N.M Cirillo and M. Mori — **Phys Lett B705 (2011) 498**

— Low energy neutron production by inverse beta decay in metallic hydride surfaces — with S. Ciuchi, L. Maiani, V. Riquer, G. Ruocco and M. Vignati — **Eur Phys J C72 (2012) 2193**

— Search for neutron flux generation in a plasma discharge electrolytic cell — with R. Faccini et al. — **Eur Phys J C74 (2014) 2894**

— A note on the fate of the Landau-Yang theorem in non-abelian gauge theories — with M. Cacciari, L. Del Debbio, J.R. Espinosa and M. Testa — **Phys Lett B753 (2016) 476**

— A note on polarized light from Magnetars — with L. Capparelli, A. Damiano and L. Maiani — **Eur Phys J C77 (2017) 754**

— *Direct detection of dark matter*

I report here on the promising field of theoretical investigations on new ways for detecting light dark matter. I have started a collaboration with experimental physicists in the the Physics Department of the University of Rome and Pisa, including the NEST Laoboratory of CNR and Scuola Normale Superiore, on the search of light dark matter of the WIMP/SIMP kind and axion-like particles.

We proposed 1) to use single-wall carbon nanotubes as the the fundamental units of a new kind of directional detectors exploiting the channeling of positive (carbon) ions 2) to use the same target, in external electric fields, to detect electron recoils, aiming at a much lower mass dark matter 3) to use Kilo-to-Mega-Watt microwave sources (at approximately 30 GHz), gyrotrons, to perform a new class of light-shining-through-wall-experiments to search axion-like particles.

After our proposal of using aligned carbon nanotubes for directional detection of WIMPs/SIMPs, with a a mass at the GeV scale, a joined group at Princeton and Berkeley made a similar proposal to use electron recoils from graphene layers for directional detection of sub-GeV dark matter particles — this was put in the context of the PTOLEMY-DM experiment, which is now being considered as a new project for the Gran Sasso Laboratories. We eventually joined this collaboration.

The option of using also or alternatively carbon nanotube targets is under discussion. We recently received a support from Sapienza to undertake this research and are starting a collaboration with some condensed matter physicists in our department and at Ciemat (Spain).

The research on carbon nanotube array detectors, project name: DeCANT, was also sponsored by the INFN.

As for the project on axion-like particles with sub-THz sources, one of the members of our collaboration recently agreed with CERN on the possibility to use one of their spare quadrupoles. An ongoing activity, led by F. Giazotto at NEST, continues on the side of research and development of ultra-cold sensors for single photons in the ~30 GHz range.

The research on axion-like particles with sub-THz photons, project name: STAX, was also sponsored by the INFN.

Both activities were motivated by the `What Next?` conference organized by INFN a few years ago.

A group at Berkeley recently suggested to use liquid Helium for light dark matter searches. One of the projects for the future is to explore this possibility in collaboration with a team at Columbia, including a former student of mine, who developed new techniques to study excitations in quantum liquids.

This is for the moment a small field. One of the very first community workshops were very recently promoted at SLAC and at Weizmann Institute.

Very recently we have also examined, and challenged, two very interesting Standard Model Dark Matter candidates: the (uuddss) exaquark baryon and primordial black holes created by instability in the Higgs potential.

— Directional dark matter searches with carbon nanotubes — with L. Capparelli, G. Cavoto and D. Mazzilli — **Phys Dark Universe 9-10 (2015) 24**

— WIMP detection and slow ion dynamics in carbon nanotube arrays — with G. Cavoto, E.N.M. Cirillo, F. Cocina and J. Ferretti — **Eur Phys J. C76 (2016) 349**

— Axion-like particle searches with sub-THz photons — with L. Capparelli, G. Cavoto, J. Ferretti, F. Giazotto and P. Spagnolo — **Phys Dark Universe 12 (2016) 37**

— Sub-Gev Dark matter detection with electron recoils in carbon nanotubes — with G. Cavoto and F. Luchetta — **Phys Lett B776 (2018) 338**

— Dark Sectors 2016 Workshop: Community Report — J. Alexander et al. — **arXiv:160808632**

— Dark Matter in the Standard Model? — with C. Gross, A. Strumia, A. Urbano and Wei Xue — **arXiv: 1803.10242.**

Summary of Scientific Achievements

The following table is taken from the **inSpires** SLAC-Stanford database (http://inspirehep.net) — the main reference database in particle physics.

Citation Summary	Citeable papers, including proceedings and other scient. docs.	Published (in refereed journals)
Total number of papers	132	97
Total number of papers (last 15 years)	110	78
Total number of citations	10547	8928
Total number of citations (last 15 years)	6901	5287
Average citation per paper	80	92
Average citation per paper (last 15 years)	63	68
Renowned papers (> 500)	4	3
Famous papers (250-499)	1	1
Very well known pap. (100-249)	12	9
Well known papers (50-99)	16	14
Known papers (10-49)	57	52
Less known papers (1-9)	34	17
Unknown papers (0)	7	1
H-index	40	38
H-index (last 15 years)	39	36
Normalized H-index	1.9	1.8

Three more publications on refereed journals do not appear inSpires, because published in statistical mechanics journals. They can be found at the end of the general list of publication. I also mention a book, which will be completed and released within a few months, by Cambridge University Press — Multiquark Resonances — with L. Maiani and A. Ali.

The following summary is taken from the **Google Scholar** database (https://scholar.google.it)

	All	Since 2013
Citations	12420	5980
H-index	42	29

	All	Since 2013
i10-index	91	57

The **total impact factor** and the **average impact factor** have been computed, taking into account the year of publication of each product, on the set of 95 publications in refereed journals (excluding all publications in proceedings). Data have been taken by the **inCites Journal Citation Reports** database (Clarivate analytics)

Total Impact Factor	Average Impact Factor
439.21	4.62

According to the WOS-Clarivate database

Total Number of Publications	Sum of times cited	Average Citation per item	H-index
102	4750	46	31

Selected publications covering the last 10 years

The list of selected papers (in the last 10 years) as from the inSpires database (http://inspirehep.net). More than half of them are taken from the last 5 years.

1 — A theory of scalar mesons — with G. 't Hooft, G. Isidori, L. Maiani and V. Riquer — **Phys Lett B662 (2008) 424 — Cited by 192**

2 — Is the X(3872) production cross section at Tevatron compatible with a hadron molecule interpretation? — with B. Grinstein, C. Bignamini, F. Piccinini and C. Sabelli — **Phys Rev Lett 103 (2009) 162001 (Editors' Suggestion) — Cited by 133**

3 — Exotic hadrons with hidden charm and strangeness — with N. Drenska and R. Faccini — **Phys Rev D79 (2009) 162001 — Cited by 77**

4 — Charmed Baryonium — with G. Cotugno, R. Faccini and C. Sabelli — **Phys Rev Lett 104 (2010) 132005 — Cited by 54**

5 — The 2-+ assignment for the X(3872) — with T. J. Burns, F. Piccinini and C. Sabelli — **Phys Rev D82 (2010) 074003 — Cited by 45**

6 — New Hadronic Spectroscopy — with N. Drenska, R. Faccini, F. Piccinini, F. Renga and C. Sabelli — **Riv Nuovo Cim 33 (2010) 633 — Cited by 84**

7 — Probing Minimal Supersymmetry at the LHC with the Higgs boson mass — with L. Maiani and V. Riquer— **New J. of Physics 14 (2012) 073029 — cited by 47**

8 — The post Higgs MSSM scenario: Habemus MSSM? — with A. Djouadi, L. Maiani G. Moreau — **Eur Phys J C73 (2013) 2650 — Cited by 102**

9 — A J^PG=1++ charged resonance in the Y(4260) → π+π- J/ψ decay? — with L. Maiani, R. Faccini, V. Riquer, F. Piccinini and A. Pilloni — **Phys Rev D87 (2013) 111102 — Cited by 91**

10 — The Z(4430) and a new paradigm for spin-interactions in tetraquarks — with L. Maiani and V. Riquer — **Phys Rev D89 (2014) 114010 — Cited by 118**
See the comment on Quanta Magazine - Simons Foundtation
https://www.quantamagazine.org/newfound-tetraquark-fuels-quantum-debate-20140827/

11 — Four-Quarks Hadrons: an Updated Review — with A. Esposito, A. Guerrieri, F. Piccinini and A. Pilloni — **Int J Mod Phys A30 (2015) 1530002— Cited by 134**

12 — Fully covering the MSSM Higgs sector at the LHC — with A. Djouadi, L. Maiani, J. Quevillon and V. Riquer— **JHEP 1506 (2015) 168 — Cited by 104**

13 — The new pentaquarks in the diquark model — with L. Maiani and V. Riquer — **Phys Lett B749 (2015) 289 — Cited by 115**

14 — Directional dark matter searches with carbon nanotubes — with L. Capparelli, G. Cavoto and D. Mazzilli — **Phys Dark Universe 9-10 (2015) 24 — Cited by 14**

15 — Hybridized Tetraquarks— with A. Esposito and A. Pilloni — **Phys Lett B758 (2016) 292 — Cited by 37**

16 — Multiquark resonances — with A. Esposito and A. Pilloni — **Phys Rept 668 (2016) 1 — Cited by 71**

Undergraduate Students (2007-2017)

Later carreer is indicated after "/". The "*" is for Laurea breve (mid-term thesis).

1. M Bergantino (On the PVLAS effect) / works for a consulting company.
2. N Drenska (Tetraquark Phenomenology) / obtained PhD at Roma1 with R. Faccini / works with a private Bank institute.
3. F Brazzi* (Supersymmetry in Quantum Mechanics)/ (Exotic XYZ resonances in medium) / obtained Ph.D. at Roma3 / School teacher.
4. A Marruzzo* (The Fractional Quantum Hall Effect) / obtained PhD at Roma1 / works at Anvur.
5. G Cotugno (Charmed Baryonium) / obtained PhD at Oxford, UK / consultant in Pert, Australia.
6. L Riggio (Unruh Effect at PlasmonX) / obtained PhD at Roma3.

7. B van Heck (Magnetic Confinement in Graphene) / PhD at Leiden U. Holland / Post-Doc at Yale, USA / now staff member at the MicrosoftQ Labs for quantum computation in Santa Barbara University, under the Field Medalist M. Firedmann.
8. V Prosperi (B —> J/psi decays at low J/psi momentum) / obtained PhD at Pavia U.
9. A Guerrieri* (Topological quantum computation) / obtained PhD from Roma2 / now postdoc at ICTP Sao Paolo, Brazil.
10. M Mori (Random Matrix Theory and Exotic Spectroscopy) / obtained PhD Roma1 / now post doc at UCSD, USA.
11. A Pilloni (H —> gg decay and dimensional regularization) /obtained PhD at Roma1 / now post-doc at JLab, USA.
12. A. Esposito (A mechanism for hadron molecules production at LHC) / will soon obtain his PhD from Columbia University, USA / Obtained a post-doc position at EPFL (Switzerland) with Prof. R. Rattazzi after having declined an offer from LBL Berkeley.
13. D. Mazzilli (Potentialities of Carbon Nanotubes in Directional Dark Matter Searches) / PhD student at Roma1.
14. L. Capparelli (Potentialities of Carbon Nanotubes in Directional Dark Matter Searches) / obtained PhD fellowship at University of California Los Angeles, USA which he left after one year / now PhD student at Roma1.
15. G Filaci (Fenomenologia degli stati a quattro quark: studio della Y(4220)) / Obtained PhD fellowship with L. Del Debbio at the University of Edinburgh, UK.
16. F. Cocina (Ion Scattering in large Carbon Nanotube Arrays)/ obtained a PhD fellowship at the University of Zurich.
17. F Luchetta (Electron recoils from light dark matter in carbon nanotubes) / ongoing.
18. A. Damiano (On polarized light from Magnetars) / Graduated in January 2017.

Post-graduate Students

- A Pilloni (Exotic Hadron Spectroscopy) / Currently Post-Doc at Jefferson Lab.
- C Sabelli (Exotic Hadron Spectroscopy) / Former Post-Doc at Scuola Normale Superiore di Pisa.

INFN Post-Doc Collaborators

- R Jora (Large N QCD in low dimensions) / now staff member in a Romanian University
- T Burns (Exotic hadron Spectroscopy) / now lecturer in Durham.
- J Ferretti (Nuclear theory aspects in dark matter searches) / now Post Doc in Beijing.

Teaching

- General physics for the international medical school (11/12-16/17) — Sapienza University
- Relativistic quantum mechanics for astrophysicists (16/17) — Sapienza University, Physics Department
- Non relativistic quantum mechanics (17/18) — Sapienza University, Physics Department

- Symmetries and fundamental interactions I (11/12-15/16, 17/18) — Sapienza University, Physics Department
- Group theory for physics (16/17), for the PhD School — Sapienza University, Physics Department
- General physics for nurses (11/12-12/13) — Sapienza University (Terracina Hospital)
- General physics for nurses (11/12-15/16) — Sapienza University (Priverno center for neurophysiology)

Other academic duties

- Erasmus Coordinator for the Department of Physics, Sapienza University
- President of the INFN-Rome committee for Assegni di Ricerca

Recent Conferences (late 2017 and 2018)

I list some recent conferences I have been invited to give especially plenary talks.

- Bound states in QCD and beyond, February 20-23, 2017, Schlosshotel Rheinfels, Germany.
- BSM in direct, indirect and tabletop experiments, November 05-16, 2017, Weizmann Institute of Science, Israel.
- Physics Beyond Colliders Annual Workshop, November 21-22, 2017, CERN Switzerland.
- Organizer of Bound States in Strongly Coupled Systems GGI, March 12-16, 2018, Florence, Italy
- 3rd Workshop on LHCb Upgrade II, March 21-23, 2018, LAPP Annecy, France
- The 9th International Workshop on Charm Physics (CHARM18), May 21-25, 2018, Budker INP, Novosibirsk, Russia
- LOW ENERGY CHALLENGES FOR HIGH ENERGY PHYSICISTS (2018), June 18-22, Perimeter Institute, Canada.
- Heavy Quarks and Leptons, May 27 - June 1, Yamagata, Japan
- LHCP, June 4 - 9, Bologna, Italy
- Conference on Raoul Gatto, Sept. 28, GGI, Florence, Italy

Earlier conferences (invited talks)

- Congresso Naz. di Fis. Teor., Cortona, Italy, May 98.
- Rencontres de Blois, Blois, France, June 99.
- Eurodaphne Meeting 2000, Granada, Spain, Feb. 00.
- Frascati Spring School, Frascati, Italy, May 00.
- Eurodaphne Meeting 2001, Frascati, Italy, Jan. 01.
- Nordic LHC Physics Workshop, Oslo, Norway, Mar. 01.
- Workshop on QCD, Martina Franca (Bari), Italy, June 01.
- QCD Workshop, Parma, Italy, Feb. 02.
- CDF Workshop, Roma, Italy, Dec 02.
- CKM Workshop, Durham, England, March 03.
- IFAE, Lecce, Italy, April 03.
- QCD@Work, Conversano, Italy, June 03.
- Heavy Ion Forum, CERN, Feb. 04.

- IFAE, Torino, Italy, April 04.
- Workshop on Hadron Spctroscopy, Barcellona, Spain, Sept. 04.
- Hadron05, Rio de Janeiro, Brasil, Aug. 05.
- European Strategy for Particle Physics – Working Group, Orsay, France, Jan. 06.
- IFAE, Pavia, Italy, Apr. 06.
- Quarkonium Working Group, Brookhaven, USA, Jun. 06.
- Hadron Physics Workshop, Milos, Greece, Sept. 06.
- Charm07, Cornell, USA, Aug. 07.
- Int. School of Subnuclear Physics, Erice, Italy, Sept. 07.
- Quarkonium Working Group, DESY, Oct. 07.
- Working Group on SuperB Factory, Valencia, Spain, Jan. 08.
- Rencontres de Physique, La Thuile, Italy, Feb. 08.
- Heavy Flavor Physics Workshop, Capri, Italy, June 08.
- Jefferson Lab - Elba X, Elba, Italy, June 08.
- IHEP, Philadelphia, USA, July 08.
- Quarkonium Working Group, Nara, Japan, Nov. 08.
- DIS, Madrid, Spain, Apr. 09.
- European Physical Society Conference, Krakow, Poland, Lug. 09. QCD Convener
- CharmEx, Bonn, Germany, Aug. 09.
- CDF-Italia, Trieste, Italy, Aug. 09.
- ALICE-Italia, Trieste, Italy, Sept. 09.
- CMS-Italia, Roma, Italy, Jan. 10.
- QWG2010, Fermilab Chicago, USA, May 10.
- FPCP2010, Torino, Italy, May 10.
- QCD@Work, Martina Franca, Italy, June 10.
- Beach2010, Perugia, Italy, June 10.
- SuperB Workshop, Elba, Italy, May 11.
- Athos Workshop, Camogli, Italy, June 12.
- New Results on charmonium Physics, Orsay, France, March 13.
- CHARM13, Manchester, UK, August 13.
- Incontro Nazionale di Fisica Nucleare, Padova, Italy, March 14.
- Resonance Workshop, Catania, Italy, Oct 14.
- La Thuile 2015, Italy, March 15.
- B2Tip (Belle-II) Workshop, Krakow, Poland, April 15.
- Cygnus Collaboration Conferences, Los Angeles, US, June 15
- Cortona Conference, GGI Florence, Italy, May 16
- JLAB Elba XIV Workshop, Elba, Italy, June 16
- LHCP, Lund, Sweden, June 16

Invited talks at Universities and research centers

CERN General Colloquium (Switzerland) (twice),
CERN Theory Seminar,
DESY (Germany),
HIP-Helsinki (Finland),
University of Lyon (France),
University of Oslo (Norway),
LAPP-TH Annecy (France),
Univeristy of Paris VI (France),
University of Southampton (UK),
SNS-Pisa (Italy),
Universities of Napoli, Firenze, Padova, Parma, Milano, Pavia, Torino, Genova, Pisa (Italy),
SISSA Trieste (Italy),
University of Freiburg (Germany),
University of Leuven (Belgium),
LNF-Frascati (Italy),
University of Barcelona (Spain),
University of Santiago (Spain),
University of Madrid (Spain),
University of Irvine (USA),
University of Santa Cruz (USA),
CALTECH (USA),
SLAC (USA),
University of Edinburgh (UK),
University of Cambridge (UK),
University of Heidelberg (Germany),
DESY (Germany),
NIKHEF (Holand),
University of Zurich (Switzerland)

Rome, 29/03/2018

Antonio Davide Polosa

AD Polosa