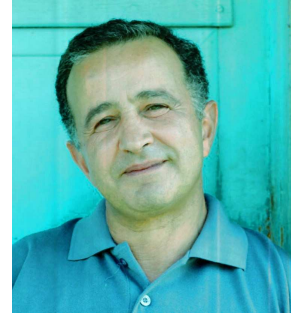


CURRICULUM VITÆ

August 2017
(partially updated in 2021)

<u>Name</u>	Abdelhak DJOUADI
<u>Birth</u>	April 14, 1960 in Béjaia (Algeria)
<u>Family Status</u>	Married, two daughters (14 and 12 years old)
<u>Positions</u>	Professor at Universidad de Granada (Spain) Scientific Associate at CERN (Switzerland) Director of Research at the CNRS (France)
<u>Address</u>	Centro Andaluz de Física de Partículas Elementales Universidad de Granada, E-18071 Granada, Spain
<u>Phone</u>	office +34 958 241730, mobile +41 79 724 6098
<u>E-mail</u>	abdelhak.djouadi@cern.ch
<u>Web pages</u>	Inspire HEP: http://inspirehep.net/author/profile/A.Djouadi.1 Wikipedia: http://fr.wikipedia.org/wiki/Abdelhak_Djouadi



Education and Research:

- Education: 1984: Diplôme d'Études Supérieures in Physics, Université d'Alger (Algeria)
1988: Doctorat in Theoretical Physics (PhD), Université de Montpellier
1994: Habilitation Thesis (HDR), Université de Montpellier
- Positions: 1988–1992 : Postdoctoral positions in Aachen and DESY–Hamburg (Germany)
1992–1995: Research and teaching position, Université de Montréal (Canada)
1995–1996: German Fund. Research position, Universität Karlsruhe (Germany)
1996–2000: Chargé de Recherche at National Center of Scientific Research (CNRS)
2000–2020: Directeur de Recherche at the CNRS, Université Paris-Sud
2009–present: Scientific Associate at CERN, Geneva
2021–present: Talenta Senior Professor, Universidad de Granada.

Grants and coordination of research networks/teams:

- Mobilitas Plus Top Researcher Grant (PI) from Estonian Research Council (2017–2022).
- PI of a European Research Council (ERC) Advanced Grant “Higgs@LHC” (2013–2018).
- Co-director of a CNRS Research Group “GDR Terascale” with ≈ 100 members (2009–2012).
- Coordinator of the French nodes (3 and 4 laboratories) in two grants for European “Research Training Networks”: “HEPTools” (2006–2010) and “Physics at Colliders” (2000–2004).
- Coordinator of a project with U. Beijing with France–China Particle Phys. Lab. (2008–2009).
- Coordinator (PI) of a French ANR grant “Physics at Colliders and Cosmology” (2005–2008).
- Coordinator of an Indo–French research program “CPV and Supersymmetry” (2002–2006).
- Coordinator of an exchange program between France and Greece, PLATO (2001–2003).

Supervision of students and teaching/training activities:

- Supervision and co-supervision of Master and PhD students and post-doctoral fellows:
 - 12 PhD theses (7 have academic/postdoc positions, 4 are in industry and 1 still a student);
 - 12 postdoctoral fellows (6 have permanent academic positions and 6 are still postdocs);
 - a few Diploma students in Germany and numerous Master students in France.
- Participation in the jury of about 50 PhD or Habilitation theses. The latest ones are at Saclay, Grenoble, Trieste, Jussieu for PhD and Bonn, Orsay and Saclay for Habilitation.
- More than 30 invited lectures in advanced particle physics schools. The latest ones are:
 - CMS data analysis school, DESY Hamburg, Germany, September 2016.
 - Meeting of the European network HEPTOOLS, Granada, Spain, April 2016.
 - 4th GIF School, “The future after the Higgs discovery”, Strasbourg, France, September 2015.
 - “Galileo Galilei Institute for Theoretical Physics”, Florence, Italy, September–October 2014.
 - “Summer School on the Standard Model and Beyond”, Corfu, Greece, September 2014.
 - “Laboratori Nazionali di Frascati Spring School”, Frascati–Rome, Italy, May 2014.
 - Master Lectures, Physics Department, Univ. Constantine, Constantine, Algeria, April 2014.
 - “Summer School on Particle Physics: Higgs and EWSB”, ICTP Trieste, Italy, June 2013.

Organisation of and participation in conferences and workshops:

- Organisation of several international conferences and workshops. Among recent ones are:
 - The series of conferences “Higgs Hunting” in Paris, annual from summer 2010 to summer 2017.
 - “GDR Terascale” meetings (Paris, Lyon, Heidelberg, Brussels...): bi-annual from 2009 to 2012.
 - “35th Inter. Conference on High Energy Physics”, Paris, July 2010 (loc, ≈ 1000 participants).
- Session organiser or convener of working groups at conferences, workshops; most recent: “Galileo Galilei Institute, ”Collider Physics and the Cosmos”, Florence, 2017; “37th Int. Conf. on High Energy Physics”, ICHEP 2014, Valencia, July 2014; “21st Int. Conf. on Supersymmetry and Unification”, Trieste, August 2013; “Physics and Detectors at CLIC: Conceptual Design Report”, CERN, 2011–2012; “Particle Astrophysics IV” Workshop, Beijing, Sept. 2008.
- Member of the International Organizing Committee of various conferences; most recent:
 - “Inter. Workshop on High-Energy Physics and QFT”, Moscow (Russia) in 2017, 2015, 2013.
 - “Inter. Workshop on Higgs as a Probe of New Physics”, Toyama (Japan) in 2013 and 2015.
 - “Linear Collider Workshop”, Hamburg (Germany) May 2013 and Chicago (USA) Nov. 2008.
 - “8th Int. Conference on Progress in Theoretical Physics”, Constantine (Algeria), Oct. 2011.
 - “International XIX Hadron Collider Physics Symposium”, Evian (France), November 2009.
- Talks at ≈ 150 international conferences and workshops (and > 100 seminars in laboratories). Most recent: “Collider Physics and Cosmos”, GGI, Florence, Sep. 2017; “ CMS Physics Object School”, Bari, Sep. 2017; “What comes beyond the Standard Model?”, Bled (Slovenia), July 2017; “Jorge Romao Fest”, Lisbon, July 2017; “ATLAS SUSY and Exotic workshop”, Bucharest, May 2007; “Higgs and Cosmology”, Royal Society meeting, UK, March 2017; “Physics in LHC and Early Universe”, Tokyo, January 2017; “Higgs Forum”, Helsinki, Dec. 2016; “Multi-Higgs models”, Lisbon, Sep. 2016; “Planck”, Valencia, June 2016; “Rencontres de Moriond”, La Thuile (Italy) March 2016; “The 750 GeV excess”, Rome, January 2016; “The High Energy Physics KIT”, Karlsruhe, Oct. 2015; “Higgs Days”, Santander, Spain, Sept. 2015; “New Frontiers in Physics”, Kolymbari (Greece), August 2015 and 2014; “Rencontres de la Vallée d’Aoste”, La Thuile (Italy) March 2015; “Séminaire Poincaré XIX, le Boson H”, Paris, Nov. 2014.

Other scientific activities:

- Referee in the major reviews in particle physics: European Journal of Physics C, Nuclear Physics B, Physics Letters B, Journal of High-Energy Physics, Europhysics Letters, Physical Review D, Physical Review Letters, Inter. Journal of Modern Physics, Modern Physics Letters.
- Member of evaluation panels: ERC (Brussels), AERES and ANR (France), PPARC (UK), NSF (USA) and for academies/foundations/universities in Austria, Belgium, Chile, Greece, India, Poland, Switzerland, USA, UK and evaluation or hiring panels for several universities.
- Member: Scientific Council of three French laboratories: LAL Orsay, LLR Polytechnique, LAPP Annecy; Conseil de Groupement of Euro-GDR Supersymmetry 2004–08; International Detector Advisory Group for “International Linear Collider” (ILC); French Committee for ILC and CERN fellowships; “Commission des Spécialistes”, Université Montpellier II (1998–2006).

Outreach activities and distinctions:

- Interviews in various medias: “Le Journal du CNRS” (2007, 2008), “Sciences et Vie” (2008–2012 and 2016), “Planète Gaia” (2008–2013), “La Recherche” (2016); newspaper “Le Monde” (2013, 2016) or radios France Inter (2008), Radio Cirta (2014), France Culture (2016).
- Popular article “Le boson de Higgs au LHC” in 2009 for the review “Images de la Physique”.
- Participation to artistic/scientific expositions: “Alphabet of Universe (Alexandria, Egypt) in January 2005 and “Passionate About: Particle Physics”, CERN and Vienna in July 2015.
- Public conferences like: “Higgs and particle physics”, Association Odyssee, Paris, 2017; “Marvelous Complexity Festival”, Trieste, 2015; Inauguration International Year of Light, Algiers, 2015; talks at Béjaia (2015) and Constantine (2014) universities; Norwegian symposium for Nobel prize ceremony, Oslo, 2013; Higgs Symposium of Max-Planck Society, Berlin, 2012.
- Presentations to undergraduate students, elementary schools, university open days, etc...
- Invitations/stays (≥ 4 months): DESY-Hamburg (1993,1995), CERN (associate 2003), Jussieu-Paris (2004), U. Southampton (Leverhulme Prof., 2007), U. Bonn (Humboldt Prize, 2008).
- Awards: Laureate of a European Research Council (ERC) Advanced Grant (EU, 2012); Silver Medal of the CNRS (France, 2007); Gay-Lussac von Humboldt Prize (Germany, 2007).

Research domain and a brief summary of main scientific work:

My field of research is theoretical physics and the phenomenology of the strong and electroweak interactions of elementary particles and the search for new physics beyond the Standard Model, the fundamental theory that presently describes them. My main focus was on the physics of the Higgs boson at high-energy colliders and the prediction of its production and detection rates that allowed the discovery of the particle at the CERN Large Hadron Collider (LHC) in 2012. I also studied the manifestation of new phenomena from supersymmetric theories and models of extra space-time dimensions as well as the physics of the particles that form the dark matter in the universe both in astroparticle and collider experiments. Some achievements are as follows.

- Precise determination of the Higgs boson production rates at hadron colliders such as the LHC. I calculated the dominant quantum corrections from strong interactions to the by far main production channel, the gluon-fusion mechanism, corrections that increase the rate by a factor of two. In collaboration with M. Spira and P.M. Zerwas, two very important papers were written on the subject, one for the Standard Model Higgs boson and one in supersymmetric theories.

- Precise determination of the Higgs boson decay rates in the Standard Model and supersymmetric theories including all relevant higher order effects such as radiative corrections, loop induced channels, multi-body final states and non-conventional decays in supersymmetric models. All the features are implemented in the program `HDECAY`, written with J. Kalinowski and M. Spira, which became the basic Higgs boson decay tool used by the experimental collaborations.

- Detailed investigation of the Higgs boson profile at proton and electron-positron colliders in the Standard Model and beyond: analyses of the main signal channels, measurement of the Higgs quantum numbers and interactions including self-couplings, impact of new physics, etc... Many issues have been sharpened in important workshops in which I convened the Higgs working groups. All these standard and supersymmetric Higgs studies have also been summarized in two Physics Reports in 2005, which became the most cited published reviews on Higgs physics.

- In 2010–11, with my PhD student Julien Baglio, I performed a detailed analysis of the Higgs production and decay rates first at the Tevatron and then at LHC including all relevant effects and made a critical assessment of the theoretical uncertainties. These studies are the base of the Higgs searches and studies that were performed by the experimental collaborations.

- Since December 2011 and the first hints, I investigated (in particular with my PhD student Jérémie Quevillon) the implications of the Higgs discovery for the Standard Model, e.g. stability of the electroweak vacuum, Higgs spin-parity quantum numbers and (self)couplings, as well as for supersymmetric models, dark matter, the presence of a fourth fermion generation, etc.

- Precision physics in the Standard Model: I performed one of the first exact calculations of radiative corrections at the two-loop level in the SM: the QCD corrections to the W,Z boson self-energies induced by massive quarks, which played a prominent role in precision tests of the model. I also made the first proposals for using the Z-boson decay into bottom quark pairs at the LEP collider to test the model: the forward-backward asymmetry A_{FB}^b turned out to provide the best measurement of the weak mixing angle $\sin^2 \theta_W$, while the partial decay width into bottom quark pairs $\Gamma(Z \rightarrow b\bar{b})$ provided very powerful constraints on new physics models.

- Collider phenomenology of new physics models such as supersymmetry, grand unification, compositeness and extra space-time dimensions. In the latter case for instance, I studied the impact of the Kaluza-Klein excitations of gauge bosons and fermions on the physics of top and bottom quarks. In grand-unified theories, I analysed the collider signatures of the new gauge bosons and new fermions. In supersymmetric theories, I thoroughly analysed the particle spectrum in the constrained and unconstrained versions of the models and studied their production and decays and the determination of their basic properties. The various studies led to programs that are widely used by theorists and experimentalists, in particular the codes `SuSpect` and `SDECAY` for the spectrum and the decays, two basic tools in supersymmetry phenomenology.

- The cosmological Dark Matter: I studied the relic density in the universe of cold dark matter particles in supersymmetric theories and in Higgs-portal models and the possibility of detecting these states both at high energy colliders and directly in astroparticle experiments.

Summary of publications and impact: (updated in March 2021)

262 scientific papers: 219 e-prints with 153 published in peer-reviewed international journals. A summary from the *Inspire* HEP database is as follows (for the complete and updated list of publications and for details see: <http://inspirehep.net/author/profile/A.Djouadi.1>):

papers by citation	e-print papers	published only
total eligible papers analyzed	219	153
renowned papers (500+ cites)	13	12
famous papers (250–499 cites)	19	15
very well-known papers (100–249 cites)	53	45
well-known papers (50–99 cites)	42	37
<hr/>		
total number of citations	32,194	27,826
average citations by paper	147	182
h-index	90	84

Some selected publications (with the number of citations from the *Inspire* HEP database):

1. *HDECAY*: a program for Higgs boson decays in the SM and the MSSM, AD, J. Kalinowski and M. Spira, *Compt. Phys. Com.* 108 (1998) 56. (1849)
2. The anatomy of electro-weak symmetry breaking I: The Higgs in the SM, AD, *Phys. Rept.* 457 (2008) 1-216. (1537)
3. Higgs production at the LHC, M. Spira, AD, D. Graudenz and P. Zerwas, *Nucl. Phys.* B453 (1995) 17. (1457)
4. The anatomy of electro-weak symmetry breaking II: The Higgs bosons in MSSM, AD, *Phys. Rept.* 459 (2008) 1-241. (1419)
5. *SuSpect*: A Fortran code for the SUSY and Higgs spectrum in the MSSM, AD, J.L. Kneur and G. Moultaka, *Comput. Phys. Commun.* 176 (2007) 426. (1043)
6. Production of Higgs bosons in proton colliders: QCD corrections, AD, M. Spira and P.M. Zerwas, *Phys. Lett.* B264 (1991) 440. (1003)
7. The Snowmass points and slopes: benchmarks for SUSY searches, B.C. Allanach, M. Battaglia, AD, et al., *Eur. Phys. J.* C25 (2002) 113. (945)
8. NNLO QCD corrections to the Higgs-strahlung processes at hadron colliders, O. Brein, AD and R. Harlander, *Phys. Lett.* B579 (2004) 149. (562)
9. Virtual very heavy top effects in LEP/SLC precision measurements, AD and C. Verzegnassi, *Phys. Lett.* B195 (1987) 265. (321)
10. $\mathcal{O}(\alpha\alpha_s)$ vacuum polarization functions of the Standard Model gauge bosons, AD, *Nuovo Cimento* 100A (1988) 357. (298)

Papers published in the few last years (with the number of citations from *Inspire*):

1. Implications of LHC searches for Higgs-portal dark matter, AD, O. Lebedev, Y. Mambrini and J. Quevillon, *Phys. Lett.* B709 (2012) 65. (443)
2. The top quark and Higgs boson masses and the stability of electroweak vacuum, S. Alekhin, AD and S. Moch, *Phys. Lett.* B716 (2012) 214. (413)
3. Implications of a 125 GeV Higgs for supersymmetric models, A. Arbey, M. Battaglia, AD, J. Quevillon, *Phys. Lett.* B708 (2012) 162. (404)
4. The measurement of the Higgs self-coupling at the LHC: theoretical status, J. Baglio, AD, R. Grober, M. Muhlleitner et al, *JHEP* 1304 (2013) 151. (366)
5. Higgs production at the LHC, J. Baglio and AD, *JHEP* 1103 (2011) 055. (233)
6. Direct detection of Higgs-portal dark matter at the LHC, AD, A. Falkowski, Y. Mambrini and J. Quevillon, *Eur. Phys. J.* C73 (2013) 2455. (255)
7. Scenarii for interpretations of the LHC diphoton excess: 2HDMs and VLFs, A. Angelescu, AD and G. Moreau, *Phys. Lett.* B756 (2016) 126. (232)
8. The Higgs sector of the MSSM in the light of the Higgs discovery, A. Arbey, M. Battaglia, AD and F. Mahmoudi, *JHEP* 1209 (2012) 107. (230)
9. The LHC diphoton resonance and dark matter, Y. Mambrini, G. Arcadi and AD, *Phys. Lett.* B755 (2016) 426. (212)
10. The post-Higgs MSSM scenario: Habemus MSSM? AD, L. Maiani, A. Polosa, J. Quevillon..., *Eur.Phys.J.C* 73 (2013) 2650 (201)