

# Cédric LORCÉ

Ph.D. in Physics

Qualification:MCF-2011-29-11229217026

CV update: May 14th, 2018

*Theoretical physics* with special interests in : particle physics, fundamental interactions, symmetries and symmetry breakdowns, baryon tomography and (multi-)parton distributions, angular momentum decomposition, energy-momentum tensor, light-front wavefunctions,  $k_T$ -factorization, higher-spin physics, solitons and instantons.

## General information

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Born the 11th of May 1982 in Belgium  
Nationality : Belgian  
Single  
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**Current professional address**  
Centre de Physique Théorique  
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10, Rue Marco Polo, apt. 627  
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## Professional experience

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- Sep 2015*     **Assistant Professor** at École polytechnique  
*-now*             Center for Theoretical Physics,  
                         University of Paris-Saclay (France)
- Sep 2013*     **Postdoctoral Researcher** for the F.R.S.-FNRS (*Belgian National Fund for Scientific Research*)  
*-Aug 2015*     Group of Fundamental Interactions in Physics and Astrophysics,  
                         University of Liège (Belgium)
- Sep 2011*     **Postdoctoral Researcher**  
*-Aug 2013*     Institute of Nuclear Physics and Laboratory of Theoretical Physics,  
                         Paris-Sud University (France)
- Sep 2008*     **Postdoctoral Researcher**  
*-Aug 2011*     Institute of Nuclear Physics,  
                         University of Mainz (Germany)
- Oct 2004*     **Research Fellow** for the F.R.S.-FNRS (*Belgian National Fund for Scientific Research*)  
*-Aug 2008*     Group of Fundamental Interactions in Physics and Astrophysics,  
                         University of Liège (Belgium)

## Education and training

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- Dec 2007* **Ph.D. in Physics** at the University of Liège  
Thesis: “*Exotic and non-exotic baryon properties on the light cone*”  
Advisor: Prof. M. Polyakov  
Defended on Dec 21  
e-Print: arXiv:1010.1685 [hep-ph]
- Jun 2005* **DEA in Physics** (3<sup>rd</sup> cycle degree) at the University of Liège with highest honors  
Research report: “*Soliton and instanton calculus*”  
Advisor: Prof. M. Polyakov
- Jun 2004* **Licencié in Physics** (Master) at the University of Liège with highest honors  
Master thesis: “*Symmetry breaking and mass generation*”  
Advisor: Dr. J.-R. Cudell
- Jun 2002* **Candidat in Physics** (Bachelor) at the University of Liège with highest honors

## Awards and scientific distinctions

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- F.R.S.-FNRS Postdoctoral Researcher fellowship, Liège, Belgium, Sep 2013
- McCartor Travel Award, LIGHT CONE 2010 Workshop, Valencia, Spain, Jun 2010
- F.R.S.-FNRS Research Fellow grant, Liège, Belgium, Oct 2004
- Valedictorian, Physics Department Award, Liège, Belgium, Sep 2004

## Long stays, publications, conferences and seminars

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### Long stays

- USA :
  - Stanford Linear Accelerator Center (SLAC), Theoretical Physics Group, Menlo Park, Oct 2014-Jul 2015
  - "USA tour" : 17 Feb-5 Mar 2008
    - \* Jefferson Laboratory, Newport News, 1-5 Mar 2008
    - \* Penn State University, 104 Davey Lab, State College, 24-29 Feb 2008
    - \* University of Maryland, Theoretical Quarks, Hadrons and Nuclei Research Group, College Park, 21-23 Feb 2008
    - \* University of Washington, Institute for Nuclear Theory, Seattle, 17-20 Feb 2008
- France :
  - Commissariat à l’Energie Atomique (CEA), Nuclear Physics Unit (SPhN), Saclay, Mar 2014-May 2014
  - Paris-Sud University, Institute of Nuclear Physics (IPNO), Orsay, Sep 2013-Mar 2014
- Italy :
  - University of Pavia, Department of Nuclear and Theoretical Physics, Mar 2011-May 2011
  - University of Pavia, Department of Nuclear and Theoretical Physics, Dec 2009-Jun 2010
- Germany :
  - University of Bochum, Institute of Theoretical Physics II, Sep 2005-Aug 2007

## Publications, conferences and seminars

- 36 peer-reviewed papers
- 46 conference papers
- 33 seminars (on 25 topics)
- 66 presentations at conferences and meetings (48 as invited speaker, 6 plenary talks and 3 summary talks)
- 16 other participations to conferences

## Teaching and supervising experience

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- *Schools*
  - TMD Collaboration Summer School  
Temple U., USA, 22-28 Jun 2017
  - Second International Spring School of the GDR PH-QCD, "Correlations between partons in nucleons"  
Paris-Sud University, France, 30 Jun-4 Jul 2014
  - 29th Annual Hampton University Graduate Studies (HUGS 2014) summer school  
Jefferson Laboratory, USA, 2-20 Jun 2014
- *Advanced physics*
  - Tutorials on "Perturbative quantum field theory I"  
École polytechnique, University Paris-Saclay, France, 2016-2018
  - Tutorials on "Relativistic fields"  
École polytechnique, University Paris-Saclay, France, 2015-2018
  - Tutorials on "Variational principles and special relativity"  
École polytechnique, University Paris-Saclay, France, 2015-2018
  - Co-teaching on "Advanced quantum field theory"  
University of Liège, Belgium, 2013-2014
  - Co-teaching on "Advanced quantum mechanics"  
University of Liège, Belgium, 2013-2014
  - Lectures on "Orbital Angular Momentum in QCD"  
University of Pavia, Italy, 2013
  - Lectures on "Parton Wigner Distributions of the nucleon"  
University of Pavia, Italy, 2013
  - Exercises on "Theoretische Physik 3: Quantenmechanik"  
University of Mainz, Germany, 2010
  - Exercises on "Theoretische Physik VI: Quantenmechanik II"  
University of Mainz, Germany, 2009
  - Lectures on "A short Introduction to Instantons"  
University of Mons-Hainaut (PNT group), Belgium, 2008  
University of Liège (IFPA group), Belgium, 2008
- *General physics*
  - Physics laboratories for the 1st year of Sciences and Engineering  
University of Liège, Belgium, 2003-2004 and 2004-2005
  - Physics training sessions (Analytical Mechanics) for the 1st year of Physics  
University of Liège, Belgium, 2003-2004

- *Students*
  - Daniel Perez  
Master internship on Elements of frame field theory  
École polytechnique, University of Paris-Saclay, France, 2017-2018
  - Luca Mantovani (University of Pavia, Italy)  
Ph.D. internship on quark energy-momentum tensor in impact-parameter space  
École polytechnique, University of Paris-Saclay, France, 2016-2017
  - Rodrigo Campos de Carvalho  
Master internship on Lorentz invariance and Wilson lines  
École polytechnique, University of Paris-Saclay, France, 2016-2017
  - Ang Li  
Master internship on Angular momentum in the diquark model  
École polytechnique, University of Paris-Saclay, France, 2016-2017
  - Amit Pritish Bhoonah  
Master internship on transversely polarized quark energy-momentum tensor  
École polytechnique, University of Paris-Saclay, France, 2015-2016
  - Markus Thürmann  
Master thesis: “*Study of multiparton interaction within relativistic light-front quark models*”  
Paris-Sud University, France, Nov 2012

## Other scientific services

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- Conferences and workshops
  - Convener for the Electron Ion Collider User Group Meeting 2017 (EICUG2017), Trieste, Italy, 18-22 July 2017
  - Convener for the Conference on the Intersections of Particle and Nuclear Physics (CIPANP2015), Vail, Colorado, USA, 19-24 May 2015
  - Organizer of a workshop on “*Spin and Orbital Angular Momentum of Quarks and Gluons in the Nucleon*” ECT\*, Trento, Italy, 25-29 Aug 2014
- Referee for Ph.D. theses
  - Tanmay Maji  
Thesis: “*Transverse structure of proton and azimuthal spin asymmetries in the SIDIS processes*”  
Indian Institute of Technology Kanpur, Kanpur, India, May 2018
  - Narinder Kumar  
Thesis: “*Study of Generalized Parton Distributions using Light-Front Dynamics*”  
Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, India, November 2015
  - Alexandre Payez  
Thesis: “*Large-scale alignments of quasar polarizations: A detailed study of the spinless-particle scenario*”  
University of Liège, Liège, Belgium, May 2013
- Referee in scientific journals
  - Annals of Physics
  - European Physical Journal A and C
  - Few-Body Systems
  - Journal of High-Energy Physics
  - Journal of Physics G
  - Physics Letters B

- Physical Review D
- Physical Review Letters
- External reviewer for proposals
  - NCN (Polish National Science Center)
  - NSERC (Canadian national science foundation)
  - FWO and F.R.S.-FNRS (Belgian national science foundations)
  - CEA-Enhanced Eurotalents program

## Personal skills and competences

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### Languages

<i>French</i>	Mother Tongue
<i>English</i>	Fluent
<i>German</i>	Good
<i>Italian</i>	Good
<i>Dutch</i>	Basic Knowledge

### Computer skills

<i>Operating systems</i>	Linux/Unix, Windows
<i>Programming languages</i>	C, Fortran, Pascal
<i>Calculus languages</i>	Form, Mathematica, Matlab

### Seminars

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1. *“Angular momentum decomposition in gauge theories”*
  - Physics Division, Argonne National Lab, Argonne, USA, 16 Mar 2015
  - SLAC, Theoretical Physics Group, Menlo Park, USA, 29 Oct 2014
2. *“Quark spin-orbit correlations”*
  - University of Mainz, Germany, 23 Jun 2014
3. *“Phase-space structure of the nucleon”*
  - Old Dominion University, Norfolk, USA, 12 Jun 2014
4. *“2(+3)D structure of the nucleon”*
  - Jefferson Laboratory, Newport News, USA, 10 Jun 2014
5. *“Spin-orbit correlations in the nucleon”*
  - CEA, SPhN, Saclay, France, 14 Apr 2014
6. *“The proton spin structure”*
  - Ecole Polytechnique, LLR, Palaiseau, France, 21 Mar 2014
7. *“The proton internal structure and the quest for orbital angular momentum”*
  - University of Washington, Nuclear Theory Group, Seattle, USA, 21 Jan 2014
8. *“The proton spin decomposition: Some news about the controversy”*
  - Ecole Polytechnique, CPHT, Palaiseau, France, 3 Dec 2013
  - NIKHEF, Amsterdam, The Netherlands, 30 May 2013
9. *“What is an elementary particle ? Shedding some light on the issue”*
  - Imperial College, London, United Kingdom, 22 May 2013
10. *“Proton internal structure and the issue of orbital angular momentum”*
  - CEA, SPhN, Saclay, France, 11 Jan 2013
11. *“Controversies about the definition of the angular momentum decomposition in gauge theories”*
  - University of Mons-Hainaut, Belgium, 20 Dec 2012
12. *“Wigner distributions as an intuitive approach to the parton orbital angular momentum”*
  - University of Pavia, Italy, 5 Dec 2012
13. *“How to define and access the different contributions to the proton spin”*
  - University of Liège, Belgium, 31 Oct 2012
14. *“Quark phase-space distribution and its impact on the proton spin puzzle”*
  - Temple University, Philadelphia, USA, 22 May 2012
15. *“Quark phase-space distribution and orbital angular momentum”*
  - CHEP, Beijing, China, 28 Feb 2012
16. *“Light-front imaging of composite particles”*

- LPSC, Grenoble, France, 7 Dec 2011
17. *“Wigner Distributions in Particle Physics”*
    - Paris-Sud University, IPNO, Orsay, France, 6 Jul 2011
  18. *“Parton Distributions”*
    - University of Liège, Belgium, 23 Nov 2010
    - Ecole Polytechnique, CPHT, Palaiseau, France, 18 Oct 2010
  19. *“Hadron EM Form Factors: A Short Review”*
    - University of Liège, Belgium, 5 Mar 2010
  20. *“What are Elementary Particles?”*
    - University of Mainz, Germany, 4 May 2009
  21. *“Quark Transverse Charge Densities for Spin-3/2 Particles”*
    - University of Liège, Belgium, 8 Jan 2009
    - University of Mainz, Germany, 20 Nov 2008
  22. *“Baryon Light-Cone Wave Functions and Properties in Chiral Quark-Soliton Model”*
    - University of Mainz, Germany, 26 Mar 2008
    - Jefferson Laboratory, Newport News, USA, 3 Mar 2008
    - Penn State University, 104 Davey Lab, State College, USA, 27 Feb 2008
    - University of Maryland, Theoretical Quarks, Hadrons and Nuclei Research Group, College Park, USA, 21 Feb 2008
    - University of Washington, Nuclear Theory Group, Seattle, USA, 18 Feb 2008
  23. *“AdS/CFT Duality”*
    - University of Liège, Belgium, 29 Aug 2007
  24. *“Exotic and Non-Exotic Light Baryons”*
    - University of Liège, Belgium, 10 Feb 2006
  25. *“Solitons and Instantons”*
    - University of Liège, Belgium, 27 Apr 2005

## Presentations in conferences and meetings

(> invited, \* w/ proceedings, < plenary, o summary)

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1. > Workshop on "Getting to Grips with QCD", Campus des Cordeliers, Paris, France, 4-6 Apr 2018
2. > Workshop on "Polarized light ion physics with EIC", Ghent University, Belgium, 5-9 Feb 2018
3. > GDR QCD 2016, IPhT, CEA, Saclay, France, 4-6 Dec 2017
4. > INT Program INT-17-3 "Spatial and Momentum Tomography of Hadrons and Nuclei", University of Washington, Seattle, USA, 28 Aug-29 Sep 2017
5. > International Union of Pure and Applied Physics (IUPAP) WG.9 Nuclear Science Symposium, RIKEN Tokyo Office, Tokyo, Japan, 29-30 Aug 2017
6. o> Electron Ion Collider User Group Meeting 2017 (EICUG2017), Trieste, Italy, 18-22 Jul 2017

7. > Workshop on "Nucleon and Resonance Structure with Hard Exclusive Processes", IPNO, Orsay, France, 29-31 May 2017
8. > Workshop on "The Proton Mass: At the Heart of Most Visible Matter", ECT\*, Trento, Italy, 3-7 Apr 2017
9. > Kick-off meeting of the GDR QCD, IPNO, Orsay, France, 29-30 Sep 2016
10. >\* 4th Workshop on the QCD Structure of the Nucleon (QCD-N'16), Getxo, Spain, 11-15 Jul 2016
11. >\* QCD Evolution 2016 Workshop, Nikhef, Amsterdam, The Netherlands, 30 May-3 Jun 2016
12. <> International Conference on the Structure of Baryons (Baryons16), Florida State University Alumni Center, Tallahassee, USA, 16-20 May 2016
13. > IFPA Spring Meeting 2016, University of Liège, Sart-Tilman, Belgium, 8 Apr 2016
14. <>\* LIGHT CONE 2015 Workshop, INFN Frascati National Laboratories, Frascati, Italy, 21-25 Sep 2015
15. <>\* 6th International conference on Physics Opportunities at Electron-Ion collider (POETIC VI), Ecole Polytechnique, Palaiseau, France, 7-11 Sep 2015
16. >\* QCD Evolution 2015 Workshop, Jefferson Lab, Newport News, USA, 26-30 May
17. > Twelfth Conference on the Intersections of Particle and Nuclear Physics (CIPANP 2015), Vail, USA, 19-24 May 2015
18. > Workshop on Exclusive Meson Production and Short-Range Hadron Structure, Jefferson Lab, Newport News, USA, 22-24 Jan 2015
19. <>\* XXI DAE-BRNS High Energy Physics Symposium 2014, IIT Guwahati, Guwahati, India, 8-12 Dec 2014
20. > International workshop on Frontiers of QCD, IIT Bombay, Bombay, India, 2-5 Dec 2014
21. > Workshop on "Spin and Orbital Angular Momentum of Quarks and Gluons in the Nucleon", ECT\*, Trento, Italy, 25-29 Aug 2014
22. >\* LIGHT CONE 2014 Workshop, NC State University, Raleigh, North Carolina, USA, 26-30 May 2014
23. >\* QCD Evolution 2014 Workshop, Santa Fe, New Mexico, USA, 12-16 May 2014
24. >\* XXII. International Workshop on Deep-Inelastic Scattering and Related Subjects(DIS2014) Workshop, University of Warsaw, Warsaw, Poland, 28 Apr-2 May 2014
25. > INT Workshop INT-14-55W "Studies of 3D Structure of Nucleon", University of Washington, Seattle, USA, 24-28 Feb 2014
26. <> 10th European Research Conference on "Electromagnetic Interactions with Nucleons and Nuclei" (EINN2013), Annabelle Hotel, Paphos, Cyprus, 28 Oct-2 Nov 2013
27. > Fall Meeting of the Division of Nuclear Physics of the American Physical Society (DNP2013), Marriott Hotel and Conference Center, Virginia, Newport News, USA, 23-26 Oct 2013
28. >\* 13th International Conference on Meson-Nucleon Physics and the Structure of the Nucleon (MENU 2013), Pontificia Università della Santa Croce, Rome, Italy, 30 Sep-4 Oct 2013
29. > International Workshop on Hadron Structure and Spectroscopy (IWHSS2013), Erlangen Castle, Erlangen, Germany, 22-24 Jul 2013
30. > CLAS12 3rd European Workshop, University of Glasgow, Glasgow, Scotland, UK, 20-22 Jun 2013
31. > Structure of Nucleons and Nuclei, Palace Hotel, Como, Italy, 10-14 Jun 2013
32. >\* 3rd QCD Evolution Workshop, JLab, Newport News, Virginia, USA, 6-10 May 2013



33. ○> Physics at A Fixed Target Experiment (AFTER) using the LHC beams, ECT\*, Trento, Italy, 3-13 Feb 2013
34. Rencontres de Physique des Particules (RPP2013), LPSC, Grenoble, France, 16-18 Jan 2013
35. >\* 3rd Workshop on the QCD Structure of the Nucleon (QCD-N'12), Bilbao, Spain, 22-26 Oct 2012
36. >\* (2 talks) DIFFRACTION 2012 International Workshop on Diffraction in High-Energy Physics, Puerto del Carmen, Lanzarote, Canary Islands, Spain, 10-15 Sep 2012
37. >\* 2nd QCD Evolution Workshop, JLab, Newport News, Virginia, USA, 14-17 May 2012
38. \* QNP 2012 Sixth International Conference on Quark and Nuclear Physics, Ecole Polytechnique, Palaiseau, France, 16-20 Apr 2012
39. > International Workshop on Hadron Structure and Spectroscopy (IWHSS2012), Lisbon, Portugal, 16-18 Apr 2012
40. INT Workshop INT-12-49W "Orbital Angular Momentum in QCD", University of Washington, Seattle, USA, 6-17 Feb 2012
41. > Fall meeting of the GDR PH-QCD: nucleon and nucleus structure studies with a LHC fixed-target experiment and electron-ion colliders, Paris-Sud University, Orsay, France, 18-21 Oct 2011
42. >\* TRANSVERSITY 2011 Third International Workshop on Transverse Polarization Phenomena in Hard Scattering, Veli Losinj, Croatia, 29 Aug-2 Sep 2011
43. >\* PHOTON-2011 International Conference, Spa, Belgium, 22-27 May 2011
44. >\* 30 years of strong interactions: a three-day meeting in honor of Joseph Cugnon and Hans-Jürgen Pirner, Spa, Belgium, 6-8 Apr 2011
45. > CLAS12 2nd European Workshop, CNRS Délégation Paris Michel-Ange, Paris, France, 7-11 Mar 2011
46. > Quatrième Assemblée Plénière du GdR Nucléon, CEA, Saclay, France, 25-26 Nov 2010
47. \* SPIN2010 19th International Spin Physics Symposium, Jülich, Germany, 27 Sep-2 Oct 2010
48. Journées des théoriciens nucléaires, Lyon, France, 19-20 Oct 2010
49. > 27th Students' Workshop on Electromagnetic Interactions, Bosen, Saar, Germany, 29 Aug-3 Sep 2010
50. > TMD2010 - Workshop on Transverse Momentum Distributions, ECT\*, Trento, Italy, 21-25 Jun 2010
51. \* LIGHT CONE 2010 Workshop, Valencia, Spain, 14-18 Jun 2010
52. \* 4th Workshop on ERHMT, JLab, Newport News, Virginia, USA, 18-21 May 2010
53. <> 8th European Research Conference on "Electromagnetic Interactions with Nucleons and Nuclei" (EINN2009), Conference Centre George Eliopoulos, Milos, Greece, 27 Sep-2 Oct 2009
54. > 5th International Pion-Nucleon PWA Workshop, ECT\*, Trento, Italy, 1-5 Jun 2009
55. DPG Tagung Conference, Bochum, Germany, 16-20 Mar 2009
56. > Chairman at the Journées Jeunes Chercheurs 2008 (JJC 2008), Maison des Planchettes, Saint-Flour, France, 30 Nov-6 Dec 2008
57. \* LIGHT CONE 2008 Workshop, European Physical Society, Mulhouse, France, 7-11 Jul 2008
58. \* DIS08 Workshop, University College London, London, United Kingdom, 7-11 Apr 2008
59. >\* Joint Meeting HLPW08, University of Liège, IFPA, Spa, Belgium, 6-8 Mar 2008

60. 11th International Baryons Conference (Baryons07), Seoul National University, Seoul, South Korea, 11-15 Jun 2007
61. DPG Tagung Conference, Giessen, Germany, 12-16 Mar 2007
62. \* Journées Jeunes Chercheurs 2006 (JJC 2006), La Rochelle, France, 10-16 Dec 2006
63. Hadronth06 workshop, Peñiscola, Spain, 7-9 Sep 2006
64. \* Journées Rencontres Jeunes Chercheurs 2005 (JRJC 2005), Centre Paul Langevin, Aussois, France, 4-10 Dec 2005
65. \* Journées Jeunes Chercheurs 2004 (JJC 2004), Ile de Berder, Bretagne, France, 28 Nov-3 Dec 2004

## Participation to other conferences and meetings

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1. Rencontres de Physique des Particules (RPP2018), LPNHE, Paris, France, 11-13 Apr 2018
2. GDR QCD 2016, IPNO, Orsay, France, 8-10 Nov 2016
3. First SaporeGravis Day Meeting (I3HP3 project), Orsay, France, 23 Nov 2012
4. QWG 2011 8th International Workshop on Heavy Quarkonium, GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt, Germany, 4-7 Oct 2011
5. One-day Meeting: fixed-target projects at CERN, University of Paris-Sud XI, IPNO, Orsay, France, 7 Jul 2011
6. CRC 443 “Many body structure of strongly interacting systems” Conclusive Symposium, University of Mainz, Mainz, Germany, 23-25 Feb 2011
7. 26th Students’ Workshop on Electromagnetic Interactions, Bosen, Saar, Germany, 30 Aug-4 Sep 2009
8. MAMI and Beyond Workshop, Mainz, Germany, 30 Mar-3 Apr 2009
9. 25th Students’ Workshop on Electromagnetic Interactions, Bosen, Saar, Germany, 31 Aug-5 Sep 2008
10. SFB/TR-meeting 16, University of Giessen, Giessen, Germany, 31 May-1 Jun 2007
11. SFB/TR-meeting, Bommerholtz, Germany, 27-28 Nov 2006
12. Workshop on eta photoproduction, University of Bochum, Bochum, Germany, 23-25 Feb 2006
13. SFB/TR-meeting: From Goldstones to Golden Stones, University of Giessen, Giessen, Germany, 23-24 Nov 2005
14. Workshop on Hard Processes, University of Dortmund, Dortmund, Germany, 11-13 Oct 2005
15. Workshop on Exotic Hadrons, ECT\*, Trento, Italy, 21-25 Feb 2005
16. Joint Meeting Heidelberg-Liège-Paris-Rostock, Spa, Belgium, 16-18 Dec 2004