

CURRICULUM VITAE

Enrico Lunghi

Born: 5th August 1974, Monselice (PD), Italy

Nationality: Italian

Languages: Italian (mother tongue), English (fluent), German (average)

Present Position: Associate Scientist at Indiana University

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Education:

- October 2000: Ph.D. in Physics at the International School for Advanced Studies SISSA-ISAS (Trieste, Italy)
Title of the Thesis: *Rare Semileptonic B decays*
Supervisor: Prof. Antonio Masiero
- October 1999: Diploma in Pianoforte at the Conservatory “Cesare Pollini” of Padova.
- 1998–2000: In September 1998 starts the Ph.D. research activity under the supervision of Prof. Antonio Masiero on B physics, CP violation and Supersymmetry.
- 1997–1998: Starting October 1997 attends courses of the Elementary Particle Theory Sector at SISSA-ISAS, passing relative examinations with full marks.
- October 1997: Starts Ph.D. in Physics at the International School for Advanced Studies SISSA-ISAS (Trieste, Italy).
- 23rd February 1997: “Laurea” in Physics at the University of Padova (Italy) with grade 110/110 cum laude.
Title of the Thesis: *The problem of neutrino masses in supersymmetric theories.*
Advisor: Prof. Giovanni Costa

Positions:

- August 2008 - Present: Associate Scientist, Indiana University
- October 2005 - August 2008: Research associate, Fermilab
- October 2002 - October 2005: Research associate, University of Zürich, Switzerland
- October 2000 - October 2002: Alexander von Humboldt fellow, DESY, Hamburg, Germany

Teaching experience:

- Course “Electricity and Magnetism”, Physics II (P222), Fall semester 2010, Indiana University
- Four lectures on Quantum Mechanics as guest lecturer in the Quantum Mechanics class (P511), Fall Semester 2009, Indiana University
- Three lectures on “Rare Semileptonic B Decays” at the Helmholtz International Summer School on Heavy Quark Physics, Dubna, August 11-21, 2008.
- Discussion leader at the 2008 Hadron Collider Physics Summer School, Fermilab, August 12-22, 2008.

- Academic lectures on "Flavor physics in the Standard Model and beyond" held at Fermilab, January 23-31, 2007.
- Lectures on the "Soft-Collinear Effective Theory" at the Helmholtz International Summer School on Heavy Quark Physics, Dubna, June 6-15, 2005.
- Supervisor of a diploma student and co-supervisor of two Ph.D. students at the University of Zürich.
- Discussion session leader for the courses "mathematical methods in physics I" (SS 2002/2003) and "mathematical methods in physics II" (SS 2003/2004) at the University of Zürich.

Service work:

Referee for Physical Review D, Journal of High Energy Physics, Nuclear Physics B.

Selected publications:

- *Improved model independent analysis of semileptonic and radiative rare B decays*,
Phys. Rev. **D66** (2002) 034002,
Cited 242 times.
- *General flavor blind MSSM and CP violation*,
Phys. Rev. **D64** (2001) 076009,
Cited 107 times.
- *B → X_sℓ⁺ℓ⁻ decays in supersymmetry*,
Nucl. Phys. **B568** (2000) 120,
Cited 100 times.
- *Untagged B → X_{s+d}γ CP asymmetry as a probe for new physics*,
Nucl. Phys. **B704** (2005) 56,
Cited 87 times.
- *Possible Indications of New Physics in Bd-mixing and in sin(2β) Determinations*,
E. Lunghi (Fermilab) and Amarjit Soni,
Phys. Lett. **B666**, 162 (2008) [arXiv:0803.4340],
Cited 74 times.
- *Implications of the B → (ρ, ω)γ branching ratios for the CKM phenomenology*,
Phys. Lett. **B595** (2004) 323,
Cited 65 times.
- *Factorization in leptonic radiative B → γeν decays*,
Nucl. Phys. **B649** (2003) 349,
Cited 62 times.

- *Complex flavor couplings in supersymmetry and unexpected CP violation in the decay $B \rightarrow \phi K_S$,*
Phys. Lett. **B521** (2001) 320,
Cited 60 times.
- *Electromagnetic logarithms in $B \rightarrow X_s \ell^+ \ell^-$,*
Nucl. Phys. **B740**, 105 (2006),
Cited 57 times.

Publications in refereed journals:

1. *Possible evidence for the breakdown of the CKM-paradigm of CP-violation,*
E. Lunghi (IU) and A. Soni,
arXiv:1010.6069.
2. *An improved observable for the forward-backward asymmetry in $B \rightarrow K^* \ell^+ \ell^-$,*
E. Lunghi (IU) and A. Soni,
Accepted for publication on JHEP, [arXiv:1007.4015].
3. *Unitarity triangle without semileptonic decays,*
E. Lunghi (IU) and A. Soni,
arXiv:0912.0002, submitted to Phys. Rev. Lett.
4. *Lattice QCD inputs to the CKM unitarity triangle analysis,*
J. Laiho, R. Van de Water and E. Lunghi (IU),
Phys. Rev. **D81**, 034503 (2010) [arXiv:0910.2928].
5. *Flavor Physics in the Quark Sector,*
M. Antonelli *et al.*
arXiv:0907.5386.
6. *Hints for the scale of new CP-violating physics from B-CP anomalies,*
E. Lunghi (IU) and A. Soni,
JHEP, **0908**, 051 (2009) [arXiv:0903.5059].
7. *Possible Indications of New Physics in Bd-mixing and in $\sin(2\beta)$ Determinations,*
E. Lunghi (Fermilab) and Amarjit Soni,
Phys. Lett. **B666**, 162 (2008) [arXiv:0803.4340].
8. *Light charged Higgs at the beginning of the LHC era,*
G. Barenboim, P. Paradisi, O. Vives, E. Lunghi (Fermilab) and W. Porod,
JHEP, **0804**, 079 (2008) [arXiv:0712.3559].
9. *Logarithmically Enhanced Corrections to the Decay Rate and Forward Backward Asymmetry in $\bar{B} \rightarrow X_s \ell^+ \ell^-$,*
T. Huber, T. Hurth and E. Lunghi (Fermilab),
Nucl. Phys. **B802**, 40 (2008) [arXiv:0712.3009].

10. *Kinetic corrections to $B \rightarrow X_c \ell \nu$ at one loop*,
T. Becher, H. Boos and E. Lunghi (Fermilab),
JHEP **0712**, 062 (2007) [arXiv:0708.0855].
11. *Footprints of the beyond in flavor physics: possible role of the Top Two Higgs Doublet Model*,
E. Lunghi (Fermilab) and A. Soni,
JHEP, **0709**, 053 (2007) [arXiv:0707.0212].
12. *Huge right-handed current effects in $B \rightarrow K^*(K\pi)\ell^+\ell^-$ in supersymmetry*,
E. Lunghi (Fermilab) and J. Matias,
JHEP **0704**, 058 (2007) [arXiv:hep-ph/0612166].
13. *Analysis of enhanced $\tan(\beta)$ corrections in MFV GUT scenarios*,
E. Lunghi (Fermilab), W. Porod and O. Vives,
Phys. Rev. **D74**, 075003 (2006) [arXiv:hep-ph/0605177].
14. *Electromagnetic logarithms in $B \rightarrow X_s \ell^+ \ell^-$* ,
T. Huber, E. Lunghi (Fermilab), D. Wyler and M. Misiak,
Nucl. Phys. **B740**, 105 (2006) [arXiv:hep-ph/0512066].
15. *Reducing the error on α in $B \rightarrow \pi\pi, \rho\rho, \rho\pi$* ,
M. Gronau, E. Lunghi (Zürich) and D. Wyler,
Phys. Lett. **B606** (2005) 95, [arXiv:hep-ph/0410170].
16. *Implications of the $B \rightarrow (\rho, \omega)\gamma$ branching ratios for the CKM phenomenology*,
A. Ali, E. Lunghi (Zürich) and A. Y. Parkhomenko,
Phys. Lett. **B595** (2004) 323, [arXiv:hep-ph/0405075].
17. *An analysis of the time dependent CP asymmetry in $B \rightarrow \pi\pi$ decays in the Standard Model*,
A. Ali, E. Lunghi (Zürich) and A. Y. Parkhomenko,
Eur. Phys. J. **C36** (2004) 183, [arXiv:hep-ph/0403275].
18. *Untagged $B \rightarrow X_{s+d}\gamma$ CP asymmetry as a probe for new physics*,
T. Hurth, E. Lunghi (Zürich) and W. Porod,
Nucl. Phys. **B704** (2005) 56, [arXiv:hep-ph/0312260].
19. *Updated NLL results for $B \rightarrow X_{s,d}\gamma$ in and beyond the SM*,
T. Hurth, E. Lunghi (Zürich) and W. Porod,
Eur. Phys. J. **C33** (2004) s382, [arXiv:hep-ph/0310282].
20. *Testing the Standard Model with $B \rightarrow (K^*, \rho)\gamma$ decays*,
E. Lunghi (Zürich),
Eur. Phys. J. **C33** (2004) s282.
21. *Factorization in B Decays within the Soft-Collinear Effective Theory*,
E. Lunghi (Zürich),
Eur. Phys. J. **C33** (2004) s265.

22. *Subleading collinear operators and their matrix elements*,
A. Hardmeier, E. Lunghi (Zürich), D. Pirjol and D. Wyler,
Nucl. Phys. **B682** (2004) 150, [arXiv:hep-ph/0307171].
23. *Factorization in leptonic radiative $B \rightarrow \gamma e \nu$ decays*,
E. Lunghi (Zürich), D. Pirjol and D. Wyler,
Nucl. Phys. **B649** (2003) 349, [arXiv:hep-ph/0210091].
24. *Implications of $B \rightarrow \rho \gamma$ measurements in the Standard Model and supersymmetric theories*,
A. Ali and E. Lunghi (DESY),
Eur. Phys. J. **C26** (2002) 195, [arXiv:hep-ph/0206242].
25. *Improved model independent analysis of semileptonic and radiative rare B decays*,
A. Ali, E. Lunghi (DESY), C. Greub and G. Hiller,
Phys. Rev. **D66** (2002) 034002, [arXiv:hep-ph/0112300].
26. *Complex flavor couplings in supersymmetry and unexpected CP violation in the decay $B \rightarrow \phi K_S$* ,
E. Lunghi (DESY) and D. Wyler,
Phys. Lett. **B521** (2001) 320, [arXiv:hep-ph/0109149].
27. *Extended Minimal Flavor Violating MSSM and implications for new physics*,
A. Ali and E. Lunghi (DESY),
Eur. Phys. J. **C21** (2001) 683, [arXiv:hep-ph/0105200].
28. *General flavor blind MSSM and CP violation*,
A. Bartl, T. Gajdosik, E. Lunghi (DESY), A. Masiero, W. Porod, H. Stremnitzer and O. Vives,
Phys. Rev. **D64** (2001) 076009, [arXiv:hep-ph/0103324].
29. *Looking for novel CP violating effects in $\bar{B} \rightarrow K^* \ell^+ \ell^-$* ,
F. Krüger and E. Lunghi (SISSA),
Phys. Rev. **D63** (2001) 014013, [arXiv:hep-ph/0008210].
30. *CP violation in rare semileptonic B decays and supersymmetry*,
E. Lunghi (SISSA) and I. Scimemi,
Nucl. Phys. **B574** (2000) 43, [arXiv:hep-ph/9912430].
31. *$B \rightarrow X_s \ell^+ \ell^-$ decays in supersymmetry*,
E. Lunghi (SISSA), A. Masiero, I. Scimemi and L. Silvestrini,
Nucl. Phys. **B568** (2000) 120, [arXiv:hep-ph/9906286].
32. *Neutrino masses and flavor symmetries*,
G. Costa and E. Lunghi (Padova),
Nuovo Cim. **110A** (1997) 549, [arXiv:hep-ph/9709271].

Proceedings:

1. *SuperB Progress Reports – Physics*,
B. O’Leary *et al.* [SuperB Collaboration],
arXiv:1008.1541.
2. *The role of collinear photons in the rare decay $B \rightarrow X_s \ell^+ \ell^-$* ,
T. Hurth, T. Huber and E. Lunghi,
”Les Rencontres de Moriond on QCD 2008” and ”Flavor Physics and CP Violation (FPCP) 2008”,
arXiv:0205135.
3. *Phenomenology of $B \rightarrow X_s \ell^+ \ell^-$* ,
E. Lunghi,
Invited talk at the EPS International Europhysics Conference on High Energy Physics (HEP-EPS 2005), Lisbon, Portugal, 21st - 27th July 2005,
PoS **HEP2005**, 278 (2006).
4. *Soft-Collinear Effective Theory: Overview and applications*,
E. Lunghi,
Invited talk at the Conference on High Energy Physics (IFAE 2004), Turin, Italy, 14th - 16th April 2004.
5. *The discovery potential of a super-B factory*,
J. Hewett, (ed.) *et al.*,
Invited talk at the Workshop on the discovery potential of an Asymmetric B Factory at 10^{36} Luminosity, Menlo Park, California, 22nd - 24th October 2003,
hep-ph/0503261.
6. *On exclusive and inclusive rare B decays: CKM phenomenology and new physics reach*,
T. Hurth and E. Lunghi,
Invited talk at 2nd Workshop on the CKM Unitarity Triangle, 5th - 9th April 2003, Durham, England, 5-9 Apr 2003 and at Ringberg Phenomenology Workshop on Heavy Flavors, 27th - 2nd May 2003, Ringberg castle, Germany.
Published in eConf C0304052:WG206,2003, [hep-ph/0307142].
7. *Improved model independent analysis of semileptonic and radiative rare B decays*,
E. Lunghi,
International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY02), Hamburg, Germany, 17th - 23rd June 2002.
Published in Hamburg 2002, Supersymmetry and unification of fundamental interactions, vol. 2, 1071-1077, [hep-ph/0210379].
8. *NNLO analysis of semileptonic rare B decays*,
E. Lunghi,
37th Rencontres de Moriond on Electroweak Interactions and Unified Theories, Les Arcs, France, 9th - 16th March 2002.
Appeared on Moriond proceedings, [hep-ph/0205135].

9. *General flavor blind MSSM and CP violation*,
A. Bartl, T. Gajdosik, E. Lunghi (DESY), A. Masiero, W. Porod, H. Stremnitzer and O. Vives,
International Europhysics Conference on High-Energy Physics (HEP 2001),
Budapest, Hungary, 12th - 17th July 2001.
Published in Budapest 2001 High energy physics, hep2001/065, [hep-ph/0112179].
10. *Extended Minimal Flavor Violating MSSM*
E. Lunghi,
International Europhysics Conference on High-Energy Physics (HEP 2001),
Budapest, Hungary, 12th - 17th July 2001.
Published in Budapest 2001 High energy physics, hep2001/065, [hep-ph/0108066].
11. *$B \rightarrow X_s l^+ l^-$ in supersymmetry*
E. Lunghi,
34th Rencontres de Moriond, Electroweak interactions and unified theories,
Les Arcs, France, 13th - 20th March 1999.
Appeared on Moriond proceedings, [hep-ph/9907329].
12. *Inclusive semileptonic charmless B decays in supersymmetry*,
E. Lunghi,
TMR meeting on Physics Beyond the SM, Trieste, Italy, 24th - 27th February 1999.
Appeared on JHEP

Conferences and Workshops:

- Lattice QCD meets experiment in Flavor Physics,
Glasgow, UK, June 2010,
CKM Fits and Lattice QCD.
- Flavor Physics and CP Violation,
Torino, Italy, May 2010,
Lessons for new physics from CKM studies.
- Lattice Meets Experiment Workshop,
Fermilab, Batavia, IL, April 2010,
Interplay of Lattice QCD and Experiment in CKM Physics.
- The New, the Rare and the Beautiful,
Zürich, Switzerland, January 2010,
Rare Semileptonic B Decays: some progress finally...
- XI SuperB Workshop,
Frascati National Laboratories, Frascati, Italy, December 2009.
Towards Super-B: QED logarithms in $B \rightarrow X_s \ell \ell$ and uses of $B \rightarrow \tau \nu$.
- Muon Collider Workshop,
Fermilab, Batavia, IL, November 2009.

- Join Workshop on V_{ub} and $|V_{cb}|$,
SLAC, Stanford, CA, October 2009.
 $B \rightarrow X_c \ell \nu$: Status of $O(\alpha_s/m_b^2)$ calculations.
- Meeting of the Division of Particles and Fields of the American Physical Society,
Detroit, MI, July 2009.
Hints for the scale of new CP-violating physics from B-CP anomalies.
- Flavor Physics and CP Violation,
Lake Placid, NY, May 2009.
Rare Radiative and Semileptonic B decays.
- Conference on the Intersections of Particle and Nuclear Physics,
San Diego, CA, May 2009.
Theory of V_{ub} and V_{cb}
- Brookhaven Forum 2008,
BNL, Upton, NY.
Unitarity triangle and new physics.
- 5th International Workshop on the CKM Unitary Triangle,
La Sapienza University, Rome, Italy, September 2008.
Possible hints of new physics in flavor physics and Inclusive semileptonic rare B decays.
- Helmholtz International Summer School on Heavy Quark Physics,
Dubna, Russia, August 2008.
Three lectures on rare semileptonic B decays.
- The 8th International Conference on Hyperons, Charm and Beauty Hadrons,
University of South Carolina, June 2008.
Hints of New Physics in Flavor interactions.
- Flavor Physics and CP Violation,
National Taiwan University, Taipei, Taiwan, May 2008.
Theoretical review on rare semileptonic decays.
- SCET Workshop 2008,
University of Mainz, Mainz, Germany, April 2008.
- Between the LHC and the B Factories,
Aspen Center for Physics, Aspen, September 2007.
Minimal flavor violation in supersymmetry.
- Brookhaven Forum 2007: New Horizons at Colliders,
BNL, Upton, NY, May 2007.
GUT inspired MSSM: dark matter and flavor before the LHC.
- HEP2005, International Europhysics Conference on High Energy Physics,
Lisbon, Portugal, July 2005.
Phenomenology of $B \rightarrow X_s \ell^+ \ell^-$.

- Helmholtz International Summer School on Heavy Quark Physics, Dubna, Russia, June 2005.
Lectures on the Soft-Collinear effective theory.
- INT Workshop on Effective Field Theory, QCD, and Heavy Hadrons, Seattle, March 2005.
Log-enhanced electromagnetic corrections to $B \rightarrow X_s \ell^+ \ell^-$.
- IFAE04, High Energy Physics Meeting, Turin, Italy, April 2004.
Soft-collinear effective theory: overview and applications.
- Discovery Potential of an Asymmetric B Factory at 10^{36} Luminosity, SLAC, Stanford, October 2003.
 $B \rightarrow \gamma e \nu$, $B \rightarrow \gamma \gamma$ and $B \rightarrow \gamma e^+ e^-$.
- Second Soft-Collinear Effective Theory Workshop, Carnegie Mellon, Pittsburgh, October 2003.
- EPS03, International Europhysics Conference on High Energy Physics, Aachen, Germany, July 2003.
Theoretical review of $B \rightarrow K^ \gamma$ and $B \rightarrow \rho \gamma$ decays.*
Soft-Collinear approach to factorization in B decays.
- Soft-Collinear Effective Theory Workshop, CERN, Switzerland, March 2003.
Factorization in $B \rightarrow \gamma \ell \nu$.
- International Conference on Supersymmetry and Unification of Fundamental Interactions, Hamburg, Germany, June 2002.
Improved model independent analysis of semileptonic and radiative rare B decays.
- 37th Rencontres de Moriond, Electroweak Interactions and Unified Theories, Les Arcs, France, March 2002.
Improved Semileptonic and Radiative Rare B decays.
- International Europhysics Conference on High Energy Physics, Budapest, Hungary, July 2001.
Extended minimal flavor violating MSSM and implications for B physics.
- UK Phenomenology Workshop on Heavy Flavor and CP Violation, Durham, UK, September 2000.
Review of $B \rightarrow X_s \ell^+ \ell^-$.
- NATO Advanced Study Institute 2000: Recent Developments in Particle Physics and Cosmology: Cascais, Portugal, June 2000.

- 35th Rencontres de Moriond, Electroweak interactions and unified theories, Les Arcs, France, March 2000.
- Triangle-seminar in Particle Physics, Vienna, Austria, November 1999.
Rare semileptonic B decays and supersymmetry.
- Workshop on Physics and Detectors for Daphne, Frascati, Italy, November 1999.
- 34th Rencontres de Moriond, Electroweak interactions and unified theories, Les Arcs, France, March 1999.
 $B \rightarrow X_s \ell^+ \ell^-$ in supersymmetry.
- TMR meeting on Physics Beyond the Standard Model, Trieste, Italy, February 1999.
Inclusive semileptonic charmless B decays in supersymmetry.
- TMR meeting on Physics beyond the Standard Model, Corfù, Greece, September 1998.

Invited talks at:

Academia Sinica (Taipei), 2008
 Argonne National Laboratory, 2006
 Brookhaven National Laboratory, 2006
 CERN, 2003,
 DESY (Hamburg), 2001
 Fermilab, 2006, 2010
 Harvard, 2007
 Illinois Institute of Technology, 2008
 Indiana University, 2008
 International School for Advanced Studies (Trieste), 2000
 Ludwig-Maximilians University (Munich), 2002
 Nordita (Stockholm), 2008
 Northern Illinois University, 2008
 Ohio State University, 2010
 Paul Scherrer Institute (Zürich), 2003
 Southern Methodist University, 2008
 Technische Universität München (Munich), 2001
 Universitat Autònoma de Barcelona, 2005
 University of Bern, 2002
 University of Chicago, 2007, 2008
 University of Karlsruhe, 2008
 University of Kentucky, 2009
 University of Illinois at Chicago, 2008
 University of Massachusetts at Amherst, 2007

University of Minnesota, 2006
University of Padova, 2004-2005-2007
University of Paris-Orsay, 2003
University of Rochester, 2006
University of Virginia, 2008
University of Valencia, 2001
University of Washington, 2005
University of York, 2008
University of Zürich, 2002, 2005, 2006, 2007.