

NAME Mr. Voutilainen, Mikko Antero
ADDRESS Helsinki Institute of Physics,
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BORN on 29 July 1979, in Liperi, Finland
NATIONALITY Finnish
RESIDENT in Helsinki, Finland
MARITAL STATUS Married, one child



EDUCATION

1 Nov 2015 **Assistant Professor** in experimental particle physics
University of Helsinki (UH) and Helsinki Institute of Physics (HIP)
(*Wu-Ki Tung Award for Early Career Research on QCD in 2015*)

Contact info.: +358-2941 50600; PL 64, 00014 University of Helsinki, FIN

26 Aug 2008 **Doctor of Science in Technology**, *passed with distinction*
Helsinki University of Technology (Aalto University), Finland, and
Diplôme national de docteur physique, *mention très honorable*
Université Paris XI, Orsay, France
(*in international joint supervision of the thesis*)

Field of study: Particle physics (grade: excellent, average 4.73 / 5)
Thesis title: Measurement of the inclusive jet cross section in p-pbar
collisions at the center-of-mass-energy of 1.96 TeV
(*Universities Research Association 2009 Thesis prize*)

Contact information: registry@aalto.fi ; PL 11000, 00076 AALTO, FIN

26 Aug 2003 **Master of Science in Technology**, *with distinction* (grade 4.65 / 5)
Helsinki University of Technology (Aalto University), Espoo, Finland
Department of Engineering Physics and Mathematics
Major in Materials physics, Minor in Mathematics

1998 **Matriculation examination**, Joensuun normaalikoulun lukio, Finland
Five *Laudatur* (top 5%): Mathematics (A-level), Physics+Chemistry,
Finnish, English (A), Swedish (A); *Eximia* (top 20%) in German (C)
(*IPhO in Iceland 1998, top ten in national Physics and Chemistry competitions.*)

LANGUAGE SKILLS

Finnish (mother tongue), **English** (fluent), **Swedish** (good skills, A-level), **German** (fair skills, C-level), **French** (elementary practical skills)

CURRENT POSITION

Assistant professor at UH (50%) and HIP (50%), Helsinki, Finland
1.11.2015– (31.10.2019)

Description of duties:

Project leader, CMS Experiment project at HIP, 2016—
Co-convener, CMS Standard Model Physics—Jets group, 2016 – 2017
PI, University of Helsinki 3-year project ('QCD'), 2013 – 2016
Lecturer, 'Structure of Matter', 'BSc seminar' at UH, 2013—
Supervisor, 2 PhD students and 1 research assistant

PREVIOUS WORK EXPERIENCE

Postdoctoral researcher at Helsinki Institute of Physics (HIP), Finland
July 2014 – October 2015; (career phase: independent researcher)
(Co-convener, CMS 'Jets and MET' group of ~100 scientists, 2014–15)

Postdoctoral researcher at University of Helsinki, Finland
May 2011 – July 2014 (excluding parental leave 12.9.2012 – 31.5.2013)
(University-wide competition, 12 awarded out of 246 applications)

CERN Research Fellow on CMS experiment (career phase: post-doc)
at CERN, in Geneva, Switzerland
Feb 2009 – May 2011
(One of the most prestigious post-doc positions in particle physics)

Other work experience:

Post-doc in CMS Physics Project at HIP (**4/2008–1/2009 at CERN** in Geneva, 1–3/2008 in Helsinki); **PhD student** on D0 experiment through HIP and University of Nebraska in Lincoln (**4/2004–12/2007 at FNAL** in Batavia, Illinois, USA); **Research assistant** at HIP (8/2003–6/2004 in Helsinki (PhD), **6–8/2002 + 10–12/2002 + 5–6/2003 at CERN** in Geneva), **Trainee** in research and modelling department at Thales Microsonics (**6–9/2001 in Sophia-Antipolis**, France), **Research assistant** at Materials Physics Laboratory of Aalto University (6–9/2000 + 2/2001), **Teaching assistant** at Aalto University (9/2000–12/2001 (3 x mathematics) + 1–3/2002 + 1–3/2003 (physics))

Career breaks

12.9.2012–31.5.2012 due to parental leave
1.7.2008–31.6.2009 due to military service

RESEARCH FUNDING AND LEADERSHIP

Research funding for project "*Precision Measurements of Quantum Chromodynamics*" from University of Helsinki, for 2013 – 2015, 145 000 EUR
Principal Investigator Mikko Voutilainen
(University-wide competition, 19 grants awarded out of 209 applications)

Co-conver (L2) of Jets and Missing E_T Physics Object Group (JetMET POG) at CMS Experiment, for 2014 – 2015
(Major POG with 6 subgroups and contributions from ~100 physicists)

Co-convener (L3) of Standard Model Physics—Jets group at CMS, 2016—2017, of Jet Energy Corrections group in JetMET at CMS, 2011 – 2012, and of JetID subgroup of CaloMet at D0 experiment, 2006 – 2007

Analysis Review Committee Chair

Determination of b-jet energy corrections using Z+b events, 2013 – 2014
Pileup Jet Identification in 8 TeV pp data, 2013

Leadership of analysis

Jet Energy Calibration in 8 TeV pp data, 2015
Measurement of jet radius ratio with $R=0.5$ and 0.7 , 2014
Jet Energy Calibration in 7 TeV pp data, 2012
Measurement of inclusive b-jet cross section at 7 TeV, 2011
Measurement of inclusive jet cross section at 7 TeV, 2010

Student supervision (main supervisor, unless otherwise stated)

Juska Pekkanen, PhD student (on-going since Mar 2014)
Hannu Siikonen, PhD student (on-going since Oct 2014)
Matias Haapaeheto, research assistant (starting Nov 2016)
PhD theses (1): Ozlem Kaya (2015, co-advisor)
MSc theses (4): Aman Abhishek (2015), Juska Pekkanen (2013), Mikael Kuusela (2012), Anne-Maria Visuri (2012)
Summer students (7): Matias Haapalehto (2015), Hannu Siikonen (2014), Arttu Pönni (2013), Tommi Tenkanen (2012), Juska Pekkanen (2011), Andrea Marini (IT, 2010), Caspar Van Leeuwen (NL, 2010)

MERITS IN TEACHING

Lecturer on ‘*Structure of Matter*’ 2013 – 2016 (in 2013 called ‘*Structure of Matter II*’) Introductory course to modern physics for 3rd year students: from semi-conductors and superconductivity to nuclear and particle physics. *5 credits (1st Fall period: 13 lectures, 6 exercise sessions), and ‘BSc seminar’ 2016—*
Organization and chairing of BSc seminars, *2x3 credits (full year)*

Teaching demonstration (for *Asst. Prof.*) given on 21.8.2015 with grade ‘*good*’

Teaching assistant on physics (3), mathematics (3) and computing (1) courses for 1st to 3rd year students in 2000—2003 and in 2013

AWARDS AND PRIZES

Wu-Ki Tung Award for Early-Career Research on QCD, 2015

"For outstanding contributions to the development of innovative techniques for jet energy calibration and the measurement of the inclusive jet cross section at the D-Zero and CMS experiments."

URA Thesis Award for best thesis completed at Fermilab in 2008, 3500 USD, 2009

Thesis recognised as the best out of ~100 eligible PhD theses.

HUT Thesis award for fast completion of PhD, 3000 EUR, 2008

HUT Study Award for fast completion of graduate courses, 1000 EUR, 2004

HUT Study Award for fast graduation, 840 EUR, 2003

HUT Study Award from prof. E. J. Nyström Fund, 5000 mk (840 EUR), 2002

TKY Study Award, 5000 mk (840 EUR), 2001

OTHER ACADEMIC MERITS

Member of Analysis Review Committees (12) at CMS

e.g. for b-jet scale with Z+b (2014, **chair**), analysis on pile-up jet identification (2013, **chair**), CMS+LHC top mass combinations (2013), quark/gluon tagging (2013), measurement of α_s (2013), jet nuclear modification factor in PbPb collisions (2012), photon/jet correlation in PbPb (2011), discovery and studies of jet quenching in PbPb collisions (2011, 2010), jet performance at 7 TeV (2010), search for high mass tt resonances (2009), boosted top-jet tagging (2009), search for leptoquarks (2008).

Member of the Finnish Physical Society

Division of Particles and Fields, Board member

Referee for scientific journals (2)

for Physics Letters B (2), European Physical Journal C (1)

Important and invited plenary talks (4) in international conferences and workshops

"ATLAS+CMS top mass: current results and future measurements", at 50th Rencontres de Moriond EW, in La Thuile, Italy, on 14–21.3.2015.

"Jet production at the LHC", at QCD@LHC 2012, in Michigan State University, Michigan, USA, on 20–24.8.2012.

"Probing QCD at high energy", at QNP2012, in Ecole Polytechnique, Palaiseau, France, on 16–20.4.2012.

"Inclusive jets at Tevatron and LHC - experimental overview", at SM Benchmarks at Hadron Colliders, in Zeuthen, Germany, on 15–17.6.2011.

SCIENTIFIC AND SOCIETAL IMPACT OF RESEARCH**Peer reviewed publications**

697 citable papers, of which 655 published (523 on CMS, 131 on D0, plus one review article). My h_{HEP} index is 116. Statistics retrieved from Inspire-HEP at <http://inspirehep.net> (M.Voutilainen.1) on Sep 26, 2016.

Conference proceedings, public notes

9 conference proceedings (DISx3, ICHEP'10, EDS'11, QNP'12, RDM'15)
4 CMS Collaboration public notes (1 PAS, 1 CMS Note, 3 DP Notes)

Internal documentation

31 CMS Collaboration internal Analysis Notes
15 D0 Collaboration internal notes

Selected list of 10 publications with InspireHEP citation count. Details in publication list.

1. *"Observation of a new boson at a mass of 125 GeV with the CMS experiment at LHC"*, CMS Collaboration, PLB 716 (2012) 30-61. (6316)
2. *"Determination of Jet Energy Calibration and Transverse Momentum Resolution in CMS"*, CMS Collaboration, JINST 6 (2011) P11002. (819)
3. *"Jet energy scale and resolution in the CMS experiment in pp collisions at 8 TeV"*, CMS Collaboration, arXiv:1607.03663 [hep-ex]. Submitted to JINST (2016). (20)
4. *"Measurement of the top quark mass using proton-proton data at $\sqrt{s}=7$ and 8 TeV"*, CMS Collaboration, PRD 93 (2016) 072004. (47)
5. *"Measurement of the double-differential inclusive jet cross section in proton-proton collisions at $\sqrt{s}=13$ TeV"*, CMS Collaboration, EPJC 76 (2016) 451. (3)
6. *"Search for narrow resonances decaying to dijets in proton-proton collisions at $\sqrt{s}=13$ TeV"*, CMS Collaboration, PRL 116 (2016) 071801. (93)
7. *"Heavy quark jets at the LHC"*, M. Voutilainen, JMPA 31 (2015) 1546008. Review article in issue *"Jet measurements at the LHC"*.
8. *"Measurements of differential jet cross sections in proton-proton collisions at $\sqrt{s}=7$ TeV with the CMS detector"*, CMS Collaboration, PRD 87 (2013) 112002. (146)
9. *"Inclusive b-jet production in pp collisions at $\sqrt{s}=7$ TeV"*, CMS Collaboration, HEP 1204 (2012) 084. (56)
10. *"Measurement of the inclusive jet cross-section in ppbar collisions at $\sqrt{s}=1.96$ TeV"*, D0 collaboration, PRL 101 (2008) 062001. (244)

SCIENCE COMMUNICATION

Blogging at <http://blogs.helsinki.fi/higgshunters> in 2008–2012

Founder, first editor-in-chief and blogger on “*Higgsin metsästäjät*”.

Media presence

Commented about Higgs boson discovery to *Yle TV news* (4.7.2012). Interviews in *Helsingin Sanomat* and *Aamulehti* (2011, 2012), *Tiede* (2011), *Tähdet ja Avaruus* (2010), *Yliopisto* (2008), *Symmetry magazine* (2007).

Other science communication merits

Regular **speaker for high school student classes** visiting Kumpula and CERN. Gave **tours to CMS cavern** for high school students (2008–2011); joined forces with cosmologists Rose Lerner and Shaun Hotchkiss to give talks on “**faster than light neutrinos?**” (2011) and “**Higgs boson**” (2012) at the Arkadia International Bookshop in Helsinki; talked about Higgs boson for the Helsinki University Alumni (2011); organized a **3D video feed from CERN** to SciFest in Joensuu (2010).

OTHER MERITS

Recent athletic achievements: completed Helsinki City Run (1/2 marathon) in 1^h59 (2016; 1^h56 in 2015), Tour de Helsinki (140 km cycling) in 5^h16 (2015), and Puoli-Pirkka (45 km cross-country skiing) in 3^h49 (2013). Played competitive volleyball in the **CERN men’s team** (2008–10), and relaxed volleyball in the **Fermilab league** (2004–07). Also enjoy gym and occasional dancing, SUPing and golf (HCP 20.1).