

Juska Pekkanen

Date of birth: 11.9.1986
Place of birth: Helsinki

September 2, 2017
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Education

Doctor of Science (Tech.), *expected defense date 15.12.2017*
Aalto University School of Science, Dept. of Applied Physics
Doctoral thesis: *Jet Particology and Search for New Massive Particles*
Course studies: 40 ECTS credits. Grade: very good 4/5.

Master of Science (Tech.), *with distinction*, 12.6.2013
Aalto University School of Science, Dept. of Applied Physics
Master's thesis: *Jets in CMS Experiment*, Grade: excellent 5/5
Major: Applied Physics (very good 4/5)
Minor: Computational Science (very good 4/5)

Bachelor of Science (Tech.), 1.3.2012
Aalto University School of Science, Department of Applied Physics
Bachelor's thesis: *Decision Tree Classifier: Implementation and Applications in Physics Research*. Grade: excellent 5/5

Matriculation Examination, 2002 – 2005

Laaajasalo upper secondary school. Mathematics (comprehensive): Laudatur, Physics: Laudatur, Mother's tongue: Magna Cum Laude, Chemistry: Cum Laude, English: Magna Cum Laude, Swedish: Magna Cum Laude



Work Experience Graduate Student, University of Helsinki & HIP, 1.3.2014 –

For my doctoral thesis I continue studying jet physics and phenomenology at the CMS experiment, now concentrating more on physics analysis and search of new discoveries.

Master's Thesis student, HIP CMS Project, 19.3. – 31.12.2012

The goal of my Master's Thesis project was to enhance accuracy of the CMS experiment at the CERN LHC through better jet energy calibration. My focus was on studying the jet energy composition.

HIP Summer Student, CMS Experiment (CERN LHC), 23.5.2011 – 19.8.2011

The summer internship project at the HIP CMS Project was focused on jet composition analyses and jet energy calibration scenarios. In addition to learning the working principles of the LHC machine and the CMS detector, I gained experience on C++ in ROOT environment.

Research Trainee, VTT Tech. Research Centre of Finland, 15.6.2010 – 31.3.2011

In the Future Internet 2 -project I implemented and applied machine learning algorithms for information security applications and performed various programming tasks including project documentation.

Positions of responsibility

Lead Analyzer, Dijet Resonance Search, CMS Experiment, 2015 – 2017

As the lead analyzer of the CMS Run 2 Dijet Resonance Search I was responsible for the entire high-mass analysis chain from data processing to the final steps where result plots for publications are produced. Results of this analysis are among the most anticipated in the field of high-energy physics.

Data Acquisition Online Shifter, CMS Experiment, 2015 – 2016

As an active DAQ shifter I was responsible for CMS data-taking during cosmic data test runs and high-luminosity collision runs in 2015 – 2016 and proactively participated in the control room operations. As a trusted shifter I was also assigned to tutor several DAQ shifting trainees.

Public Relations Responsible, University of Helsinki, 1.1.2015 – 30.11.2015

As a PR responsible of the Division of Particle Physics and Astrophysics I organized events for physics outreach and high-school student visits to Kumpula campus' laboratories before their CERN visits.

International experience

Research Assignment at CERN, CMS Experiment, 1.12.2015 – 30.11.2016

During my year at CERN I was able to boost communication with colleagues, attend meetings in person, integrate to the collaboration better and participate in service work and outreach activities.

Around the World trip, 27.2.2013 – 1.2.2014

An experience of a lifetime, a self-organized year-long around-the-world trip through South and Central America, USA, South-East Asia and Oceania after receiving MSc degree. Earth is spherical.

Summer Job at CERN, CMS Experiment, 23.5.2011 – 19.8.2011

Besides learning a lot about high-energy physics, the summer internship in Switzerland helped me to improve my French and English and made me familiar with the fascinating Central European lifestyle.

Exchange Studies in France, Grenoble Institute of Tech., 29.8.2011 – 24.2.2012

During my Erasmus semester in France I studied theoretical and experimental particle physics, French and freestyle snowboarding at the University of Joseph Fourier and Grenoble Institute of Technology.

Acknowledgements

2015 Fundamental Physics Special Recognition Award, 7.12.2015

The CMS Collaboration at CERN, CMS FPS Committee. CHF 500 cash prize.

Special Recognition as the Most Active Student of the School, 27.6.2016

2016 CERN-JINR European School of High-Energy Physics.

Funding

Travel Grant for Conferences and Schools, 19.6.2017

Waldemar von Frenckell's foundation. €5800 travel grant.

Research Grant for Doctoral Studies, 6.3.2017

Magnus Ehrnrooth foundation. €11500 grant.

Research Grant for Doctoral Studies, 28.11.2016

Alfred Kordelin Fund. €12000 grant.

Travel Grant for Conferences and Schools, 15.3.2016

Waldemar von Frenckell's foundation. €5000 travel grant.

Travel Grant for Conferences and Schools, 15.3.2015

Waldemar von Frenckell's foundation. €5000 travel grant.



CMS FPS Award Ceremony, 12/2015.

Conference talks

52nd Rencontres de Moriond, Electroweak Session 2017, La Thuile, Italy 18. – 25.3.2017

Talk title: "Jet Particology - Studying the Structure of Jets with the CMS Particle Flow Algorithm".
Local costs covered by a grant from the organizing committee.

Lake Louise Winter Institute 2016, Alberta, Canada, 7. – 13.2.2016

Talk title: "Search for new physics in final states with jets and bosons at CMS".

24th Nordic Conference on Particle Physics – Spätind 2016, Skeikampen, Norway, 2. – 7.1.2016

Talk title: "Search for narrow resonances decaying to dijets with the CMS detector".

Also a member of the Organizing Committee

Physics Days 2015, Helsinki, Finland, 17. – 19.3.2015

Talk title: "Di-Jet Resonance Search at CMS & LHC Run 2 Schedule".

Particle Physics Day 2012, Jyväskylä, Finland, 20.11.2012

Talk title: "Jet calibration in CMS".

- Summer schools** **CERN-Fermilab Hadron Collider Physics School**, CERN, Switzerland, 28.8. – 6.9.2017
- 44th SLAC Summer Institute**, SLAC, California, United States, 15. – 26.8.2016
Winner of the school competition with the project "Jets and Machine Learning"
- CTEQ/MCnet Summer School 2016**, DESY, Germany, 6. – 16.7.2016
Invited and supported by the MCnet Collaboration
- European School of High-Energy Physics – ESHEP 2016**, Skeikampen, Norway 15. – 28.6.2016
Special recognition as the most active student of the school
- Teaching and outreach**
- S’Cool Lab Workshop Tutor, CERN, Switzerland, 2015 – 2016**
As a teacher for the cloud chamber and X-ray workshops I guided Finnish and international high-school student groups through tasks illustrating the basic concepts of modern physics.
- CMS Underground Guide, LHC Point 5, Cessy, France, 2015 – 2016**
During my long visit at CERN I actively guided visitor groups at the CMS site at Point 5, which requires good communication skills, wide knowledge of the detector and responsibility in safety matters.
- Teaching Assistant, Structure of matter, University of Helsinki, fall 2014 & 2015**
Responsibilities included teaching exercise sessions and grading exercises and exams.
- Teaching Assistant, Mathematical methods for physics, University of Helsinki, fall 2012**
Responsibilities included teaching exercise sessions and grading exercises and exams.
- Selected publications**
- As of September 2, 2017 I am an author in 240 publications from the CMS Collaboration.*
- CMS Collaboration, "Search for Narrow Resonances Decaying to Dijets in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV", Phys.Rev.Lett. 116 (2016) no.7, 071801.
Significant personal contributions as a lead analyzer of the dijet team.
- CMS Collaboration, "Search for dijet resonances in proton-proton collisions at $\sqrt{s} = 13$ TeV and constraints on dark matter and other models", Phys.Lett. B769 (2017) 520-542.
Significant personal contributions as a lead analyzer of the dijet team.
- CMS Collaboration, "Jet energy scale and resolution in the CMS experiment in pp collisions at 8 TeV", JINST 12 (2017) no.02, P02014.
Responsible for single pion response and jet energy composition studies.
- CMS Collaboration, "Particle-flow reconstruction and global event description with the CMS detector", Submitted to JINST in June 2017.
Responsible for jet energy composition and pileup jet subtraction studies.
- ATLAS and CMS Collaborations, "Combined Measurement of the Higgs Boson Mass in pp Collisions at $\sqrt{s} = 7$ and 8 TeV with the ATLAS and CMS Experiments", Phys.Rev.Lett. 114 (2015) 191803.
Indirect personal contributions in jet energy scale uncertainty estimation.
- Language skills** **Finnish:** mother’s tongue. **English:** fluent. **French:** good in speaking & writing. **Swedish:** intermediate in speaking & writing. **Spanish:** intermediate everyday language. **German:** basics.
- Hobbies** Surfing, splitboarding, skateboarding, snowboarding, rock climbing, mountaineering, trekking, hiking, ice-hockey, football, floorball, running, swimming, gym, yoga, badminton etc. etc. etc.