Curriculum Vitae

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1.1.2014	Appointed as Professor in Experimental High Energy Nuclear Physics at Jyväskylä University. Inauguration May 5. 2014.
1.12.2006	Docentship in Experimental High Energy Nuclear Physics at Jyväskylä University
2005-today	Research scientist, Jyväskylä University Member of ALICE collaboration. Since 2007 ALICE/Finland project leader.
2004-2005	Research scientist, UNM Albuquerque, New Mexico, USA Involved in the PHENIX spin physics program.
2001-2004	Research Scientist of Iowa State University, Ames, Iowa at Brookhaven National Laboratory, Upton, New York, USA Joined PHENIX collaboration.
1995-2000	Postdoctoral research, Max Plank Institute Heidelberg and GSI Darmstadt, Germany. Member of CERES/NA45 collaboration.
19.1.1995	Ph.D. defense: "The experimental study of the muon-capture by ^{28}Si, ^{10}B and ^{11}B nuclei." at Czech Technical University in Prague Faculty of Nuclear Sciences and Physical Engineering Břehová 7, 115 19 Prague 1, Czech Republic.
1993-1995	Ph.D. Nuclear Physics Institute, Academy of Science of Czech Republic.
1989-1993	Ph.D. Joint Institute for Nuclear Research, Dubna, Russia.
1987-1989	Junior Scientist, Faculty of Nuclear Sciences and Physical Engineering Technical University in Prague, Czech Republic.

Born February 9, 1962 in Prague, Czech Republic (Czech citizenship).

1 Grants and funding:

- 2011: received a 5-years grant "Study of the deconfined QCD medium using high-pT probes with the ALICE experiment at CERN LHC" from the Research Council for Natural Sciences and Engineering, Finnish Academy (No. 251737) in amount of 540 k€.
- 2012 and 2015: one of the applicants (with Paula Erola, director of HIP, for CMS and Juha Äystö,) for the "High-luminosity upgrades of the CMS and ALICE detectors at CERN" (application 271838 and 293368). We received 455 k€ in total (first year) for both CMS and ALICE upgrade projects.
- 2015-2018 Continuation of the previous FIRI grant. We received 507 k€.

2 Professional Service:

- Board member of the Particle Physics Division of the Finnish Physical Society.
- Member of HIP detector laboratory advisory board.
- Chair of the "International workshop on High-p_T physics at LHC".
  - 2006 Trento, Italy.
  - 2007 Jyväskylä, Finland.
  - 2008 Tokay, Hungary.
  - 2009 Prague, Czech Republic.
  - 2010 Mexico City, Mexico.
  - 2011 Utrecht, Netherlands.
  - 2012 Frankfurt, Germany.
  - 2012 Wuan China.
  - 2013 Grenoble, France.
  - 2014 Nantes, France.
  - 2016 BNL, USA.
- Organizing committee of Transverse Dynamics at RHIC, BNL workshop 2003
- Organizer of High-p_T workshop at Annual RHIC&AGS User Meeting, BNL 2004
- International Advisory Committee of Phase transitions in strongly interacting matter conference, Prague 2004
- Organizer of High-p_T and Jet Physics at Annual RHIC&AGS User Meeting, BNL 2005
- Organizer of Jet Physcs session at ISMD2005 conference, Kromeriz, Czech Republic 2005.

- Organizer of Workshop on Critical Examination of RHIC Paradigms workshop in Austin, USA 2010
- Member of the International Advisory Committee of "Primordial QCD Matter in LHC Era, Implications of LHC Results on the Early Universe" international conference.
- Convener of heavy-ion session at 15th workshop on Elastic and Diffractive Scattering (EDS Blois workshop), Saariselka, Lapland, Finland.

3 Editorial Services

- Referee of Phys Rev Lett, European Phys Journal, Nuclear Physics A, J. Phys. G, IOP electronic journals.
- Member of paper preparation group and the internal review committees for CERES, PHENIX and ALICE papers.

4 Teaching

- FYSH550: Experimental Ultra-relativistic Heavy Ion Physics (40h lectures and 20h exercises).
- FYSH456: Experimental Methods in Particle Physics (40h lectures and 20h exercises).
- Lectures in Cracow School of Theoretical Physics, XLIV Course, 2004, New results in particle physics, Zakopane, Poland.
- Lectures in Hyytialla summer school, 2006, Hyytialla, Finland.

4.1 Students

1. Oliver Nix, MPI, Germany, CERES experiment, 1996-2000, co-supervisor.
2. Jana Bielcikova, Uni. Heidelberg, CERES experiment, 1996-2000, co-supervisor.
3. Paul Constantin, BNL, USA, PHENIX experiment, 2000-2005, co-supervisor.
4. Nathan Grau, BNL, USA, PHENIX experiment, 2000-2005, co-supervisor.
5. Robert Hobbs,, BNL, USA, PHENIX experiment, 2000-2005, co-supervisor.
6. Rafael Diaz, PhD supervisor (left to industry before finishing PhD).
7. Norber Novitzky, Jyväskylä University, PhD PHENIX experiment, supervisor (defense September 19th, 2013).
8. Jiří Král, Jyväskylä University, ALICE experiment, supervisor.
9. Beomsu Chang, Jyväskylä University, ALICE experiment, PhD supervisor.

10. Jussi Viinikainen, suoervised MSc, now PhD supervisor ALICE.
11. Esko Pohjoisaho, Supervised MSc, now PhD supervisor ALICE.
12. Mikko Kervinen, Supervised MSc, now PhD supervisor ALICE.
13. Tomas Snellman, MSc supervisor.
14. Petja Paakkinen, MSc supervisor.
15. Marton Vargyas, PhD supervisor.

4.2 Summer students

2007 Timo Alho, 2008 Tiia Monto, 2009 Mikko Kervinen, Jussi Viinikainen, 2010 Subhashish Hazarica, 2011 Tiina Naaranoja, 2012 Timo Kärkkäinen, Shawana Hameed, Esko Pohjoisaho, Tomas Snellman. 2013 Petja Paakkinen, 2014 Juha Sulo, 2015 Henri Hänninen, 2016 Jasper Parkkila.

5 Involvements in the WA98, CERES, PHENIX and ALICE experiments

5.1 WA98 and CERES

After finishing my Ph.D. I joined the heavy ion group at the Nuclear Physics Institute in Prague and became a member of WA98 collaboration, one of the heavy ion experiments on SPS accelerator at CERN [1]. Our group was responsible for development and operation of Si-drift detector tracking system [1].

In 1995 I accepted a postdoctoral position in the group headed by professor J.P Wurm in Max Plank Institute in Heidelberg, Germany and joined the CERES experiment. In 1997-98 CERES underwent a major upgrade and buit a large solenoidal Time Projection Chamber. During this period the Silicon vertex telescope consisting of two 3-inch Si-drift detectors was also upgraded. In collaboration with Pavel Rehak (BNL) and Peter Holl (MPI Munchen), we have designed a new AZTEK detector with larger acceptance (4-inch technology) and improved azimuthal resolution (interlaced anode structure). The low input capacity (≤ 0.1 pF) of this device required a development of a new special front-end chip. We have developed a low-noise BiCMOS (0.8 μm) charge sensitive preamplifier (τ=37ns) based on modification of the original design of G.Gramegna, P.O'Connor, P.Rehak and S.Hart [2]. I was also responsible for design, commissioning and operation of:

- Active buffer system, which allowed the transfer of analog signals from front-end chips to FADC system, and detector monitoring.
- Target zone mechanics allowing to operate the two silicon detectors in the limited space and high temperature environment.

[1] CERES,WA98 - heavy ion experiments at Super Proton Synchrotron (SPS) accelerator at CERN, $\sqrt{s_{\rm NN}}$=17 GeV

- First level centrality trigger electronics based on integration of Si-drift detector hit multiplicity.

All this hardware was implemented in the CERES experiment during the TPC upgrade and it was successfully operated in 1998, 1999 and 2000 runs.

5.2 PHENIX at RHIC

I joined the PHENIX[2] collaboration experiment in May 2001 as an associated researcher in the group headed by Craig Ogilvie at Iowa State University. I began the high-$p_{\rm T}$ particle correlation analysis along similar lines as we did at SPS [3]. The main motivation of my research was to study the most intriguing results in the high-p_T sector: the inclusive yield suppression, elliptic flow and di-jet correlations. We performed a detailed shape analysis of the two-particle angular correlation function and developed new methods of extraction of the mean jet transverse momentum $\sqrt{\langle j_{\rm T}^2 \rangle}$, mean intrinsic parton momentum $\langle k_{\rm T} \rangle$ and the fragmentation function deduced from the $x_{\rm E}$ distributions in pp, dAu and $AuAu$ collisions. Main results of this study are summarized in [4].

In the 2003 PHENIX run I served as the data production manager and I was responsible for online calibration and online data production. We developed the framework allowing the filtering of the particular trigger sets. This helped significantly in online monitoring of the rare trigger efficiencies and we were able to monitor the J/Ψ signal almost online.

5.3 ALICE at LHC

Since 2007 I serve as a ALICE[3]/Finland project leader. My main responsibilities within the ALICE collaboration are listed below.

- In 2008 I served as a period run coordinator and since January 2009 till April 2010 as a run coordinator for ALICE experiment. During my run-coordination term ALICE took the first $p+p$ at $\sqrt{s}$=900 GeV and later about 10 nb^{-1} of $\sqrt{s}$=7 TeV data.
- Member of collaboration board and participated in management board activities *e.g.* formulation of the ALICE publication rules.
- Chair of the paper preparation group of one of "Measurement of the partonic transverse momentum in $p+p$ collisions at $\sqrt{s}$=0.9 and 7 TeV" utilizing the leading particle correlations.
- Member of the paper preparation committee of [5].
- Convener of the high-$p_{\rm T}$ correlations working group.
- Responsible for an ALICE EMCAL single photon trigger hardware and operations. Our group was involved in the hardware and firmware development of the EMCAL L0 trigger electronics [6]
- Responsible (together with W. Trzaska) for the T0 timing and trigger detector operation and maintenance.

[2]PHENIX - heavy ion exp. at Relativistic Heavy Ion Collider (RHIC) at BNL, USA, $\sqrt{s_{\rm NN}}$=200 GeV
[3]ALICE - heavy ion exp. at Large Hadron Collider (LHC) at CERN, $\sqrt{s_{\rm NN}}$=2.76 TeV

6 Research Activities

The major part of my scientific career has been on (p)QCD related phenomena and their use in heavy-ion physics. I am interested in utilizing pQCD tools to study the partonic degree of freedom in heavy ion collisions, the low-x phenomena related to anticipated saturation of gluon and the spin structure functions, which is a subject of great importance for understanding the fundamental properties of QCD. For the heavy ion program I am involved in the study of high-$p_{\rm T}$ jet/direct photon correlations with the goal to establish the modification of the parton properties induced by excited QCD medium. The measurement of partonic primordial momenta, k_T, and the fragmentation function should shed a light on the process of parton interaction with the cold (p+A) and excited (A+A) QCD medium. The summary of the results related to my research could be found in the book "High-p_T physics in the Heavy Ion Era" I wrote with Mike Tannenbaum [7].

References

[1] E. Gatti and P. Rehak, Nucl.Instrum.Meth. **A225**, 608 (1984).

[2] P. O'Connor, P. Rehak, G. Gramegna, F. Corsi, and C. Marzocca, Nucl.Instrum.Meth. **A409**, 315 (1998).

[3] CERES/NA45 Collaboration, G. Agakichiev *et al.*, Phys.Rev.Lett. **92**, 032301 (2004), nucl-ex/0303014.

[4] PHENIX, S. S. Adler *et al.*, Phys. Rev. **D74**, 072002 (2006), hep-ex/0605039.

[5] ALICE Collaboration, K. Aamodt *et al.*, Phys.Rev.Lett. **108**, 092301 (2012), 1110.0121.

[6] ALICE Collaboration, J. Kral, T. Awes, H. Muller, J. Rak, and J. Schambach, Nucl.Instrum.Meth. **A693**, 261 (2012).

[7] J. Rak and M. J. Tannenbaum, *"High-p_T physics in the Heavy Ion Era"* (Cambridge University Press, 2013).