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# Curriculum Vitae

Wolfgang Lohmann

- 1968-1973 Student at Humboldt-Universität zu Berlin, subject of study - physics.
- 1973 Diploma degree for a study on "Diffractive Resonance Production in  $K^-p$  Scattering at 16 GeV Beam Energy", based on data recorded by a 2m bubble chamber at CERN.
- 1976 Ph.D. thesis; "Model Independent Analysis of the Reactions  $\pi^+p \rightarrow \rho\Delta^{++}$  and  $\pi^+p \rightarrow \omega\Delta^{++}$  at 16 GeV", submitted to Humboldt University, Berlin. With the measurement of spin density matrix elements in these and similar reactions a detailed analysis of the spin-parity composition of the t-channel exchange was performed for the first time. (Several Publications in Nucl.Phys. B and Phys. Lett.)
- 1977 Participation in bubble chamber experiments at the accelerator U70 in Serpukhov (Russia). Analysis of  $\pi^+p$  and  $K^-p$  scattering at 10, 16 and 32 GeV. Measurement of cross sections and spin density matrix elements.
- 1978-1982 Collaborator in a streamer chamber experiment (RISK) at the Serpukhov accelerator. The aim was the measurement of rare processes in hadron-hadron interactions at 40 GeV beam energy. My contributions: Preparation of the physics program, estimation of signal and background rates using Monte Carlo simulations and construction and commissioning of scintillator hodoscopes and highly efficient veto counters for the trigger. Part time on leave at the University of Warsaw.
- 1982-1986 Joint Institute for Nuclear Research (JINR) in Dubna, Russia; contract as senior scientist at the "Laboratory for High Energies" (Director: Prof. Baldin). Collaborator in the BCDMS experiment at CERN with the goal to study deep inelastic muon scattering off proton, neutron and nuclear targets (group of Prof. I. A. Savin). My specific responsibilities were the treatment of radiative corrections to deep-inelastic scattering (software package TERAD86, later used at HERA) and the calculation and treatment of the energy loss of muons in matter. On the first topic I worked together with Dmitry Bardin from JINR, on the second with Rudiger Voss from CERN. The software I developed for the simulation of the muon energy loss was used for the muon transport in GEANT3 and FLUKA.

1986-1989

Physicist at the "Institute for High Energy Physics" Zeuthen, on leave at CERN and ETH Zürich. I contributed with the the data analysis in the BCDMS experiment, leading to a precision measurement of the structure functions  $F_2$  and  $R$  of the proton and neutron. The publications with even today one of the most precise single measurement of the strong coupling constant  $\alpha_s$ , were finished 1989.

I joined R&D for the tracking detector of the L3 experiment at LEP (CERN) and participated in several test-beam campaigns to quantify the performance of the detectors.

1989-2001

Employed by DESY and CERN. Collaborator in the experiment L3 at CERN (Spokesperson S. C. C. Ting). In my responsibility was the construction, test, installation and commissioning of cylindrical wire chambers being part of the tracking system of L3. Later I contributed to the upgrade of the tracker by a silicon strip detektor participating in test-beam measurements, the installation and commissioning of the detector.

In the physics analysis I was engaged in experimental tests of the electroweak theory, especially in  $\tau$  lepton final states, and the search for new particles, particularly the Higgs boson, at LEP200. I was adviser of several diploma and Ph.D. theses about these subjects. All of the Ph.D. theses were the basis for dedicated L3 collaboration papers.

I was appointed as group leader in DESY from 1991-1999 and leader of the Tau Physics Analysis Group of the L3 Experiment at CERN from 1995 to 2001.

Member of the L3 publication committee.

I represented the L3 experiment in the LEPC, the LEP experiments Committee, from 1997- 2001.

In 2000 and 2001 I was invited as Visiting Scientist to the Universidad Nacional, La Plata, Argentina, several times for a few months. Together with Maria Dova studies to prepare the physics program of a future electron-positron collider, e.g. to measure the spin of a particle produced in association with a Z-boson, like the Higgs Strahlung.

2001 - 2014

Staff scientist at DESY. Several conference contributions and publications for the preparation of the physics program of future a linear  $e^+e^-$  collider, e.g. studies about the prospects to measure the Higgs boson mass, production cross section and spin. These publications finally became part of the TESLA Technical Design Report and the ILC Reference Design Report.

In parallel I started R&D for very forward calorimeters of a linear collider detector, foreseen for a precise and fast luminosity measurement. In addition to Monte Carlo simulations for the optimisation of the design I focused my effort on radiation hardness studies of several sensor materials like CVD diamond and GaAs, both options for the application in the very forward calorimeters.

The results of these studies, published in several journal articles or proceedings, became part of the ILC Reference Design Report, the CLIC Conceptual Design Report and the ILC Technical Design Report.

Annually lectures for summerstudents at DESY about Electroweak Physics

since 2006

Teaching commitments at the Technical Universities Dresden and Cottbus (Germany).

Member of the ZEUS experiment at HERA. Responsibility in the measurement of the luminosity at HERA II.

In parallel I became co-spokesperson of the BMBF (Bundesministerium für Bildung und Forschung) -JINR (Joint Institute for Nuclear Research) detector R&D program, and spokesperson of the FCAL collaboration, a worldwide detector R&D project to develop the technologies for the instrumentation of the very forward region of detectors at future electron-positron colliders.

Member of the detector R&D panel for the ILC (until 2012) and chair of a panel of external experts to review the calorimetry R&D for ILC detectors in 2006.

Member of the IAC of the conference “Physics in Collision”.

since 2007

Member of the CMS experiment at CERN. Completion, commissioning and data analysis of the BCM1F, a fast Beam-Condition-Monitor equipped with diamond sensors. I supervised several Ph.D. and master students who participated in the commissioning and analysed data to measure the performance of the device. These studies were finally essential for the use of BCM1F as an on-line luminosity monitor and its current upgrade for higher LHC luminosities.

Coordination of the activities of DESY Zeuthen within CMS.

- since 2009 Professor of Physics at the Brandenburg University of Technology, Cottbus.  
Leader of the FCAL and CMS experimental groups in DESY, Zeuthen.
- 2009 - 2012 Representation of DESY and personal participation in the European Marie-Curie project 'MC-PAD - Particle Detectors in Physics Experiments'. Partners were e.g. CERN, NIKHEF, GSI and UST Cracow.
- 2011 - 2014 Responsibility for the construction, installation and commissioning of a BCM1F-like system for beam loss monitoring at LHC, in collaboration with Bernd Dehning and Ruediger Schmidt from CERN. Contributions to beam-halo monitors of FLASH and XFEL at DESY. Upgrade of the BCM system in CMS during LS1, with major hardware contributions from my laboratory.  
Contributions to the physics analysis of CMS in the search for Higgs bosons produced in association with b-quarks. Based on the analysis performed by my Ph.D. student Igor Marfin, CMS was the first experiment which published. Since no signal was found the results were used to derive limits on the parameters of the MSSM, being currently the best from all hadron collider experiments in this channel.
- 2014 - 2015 CERN Associate, Commissioning of the Beam Radiation Instrumentation and Luminosity (BRIL) systems in CMS.
- 2015 - 2016 Guest professor at RWTH Aachen University. Leading groups to measure the tau lepton polarisation and Higgs boson parameters in data of the CMS experiment. In addition teaching responsibilities.

Wolfgang Lohmann, April 2016