



Damian Twerenbold

dipl.phys.ETH, Dr.sc.nat ETH

Rue des Prés 57a
CH-2017 Boudry
Switzerland

3 March 1956, married
Born in Sorong, New Guinea
Swiss citizenship

German, English, French, Dutch

home: +41 32 842 23 45
mobile +41 79 428 00 95
dtwerenbold@metexpert.ch

Current Position

Metromol SA, Rue du Château 10, 2000-Neuchâtel, Switzerland, www.metromol.ch
Co-Founder (2021), President and CEO.

Pioneer Mass Spectrometer Technology for highly sensitive Diagnostics and New Therapies Development.

Metexpert Sàrl, Rue du Château 10, 2000-Neuchâtel, Switzerland, www.metexpert.ch
Founder (2014) and Owner.

Business Development: Projekt MS-INFINITE, EU Horizon 2020 SME-Instrument agreement 868220
Contracts as Technical Assessor ISO 17025 and ISO 17020 for the Schweizerischen Akkreditierungsstelle (SAS), Deutsche Akkreditierungsstelle (DAkkS) and the Dutch Accreditation Council (RvA).

Personal Background

education:	2013	The London School of Economics and Political Science (LSE) Executive Summer School: Marketing Strategy
	1996	Habilitation, Privat-docent at the Faculté des Sciences de l'Université Neuchâtel
	1982-1986	PhD thesis at the ETH Zürich (summa cum lauda, Silvermedal) and Swiss Institut für Nuclear Research (SIN)
	1975-1980	study of physics at the Abteilung IX of the ETH Zürich
	1971-1975	Gymnasium Immensee, Switzerland, Matura Typus B
	1968-1971	Stiftsschule Einsiedeln, Switzerland
	1962-1968	Owing to my fathers profession as geologist for SHELL , various German and English speaking primary schools in Iran, Holland, Indonesia, Switzerland and New Zealand.
awards:	1986	"Silbermedaille der ETH" for doctoral thesis: "Giaever-Type Superconducting Tunnelling Junctions as High-Resolution X-Ray Detectors", Diss.ETH No. 8038
	1986	National Research Council Fellowship at NASA Goddard Spaceflight Center
	1987	ESA Research Fellowship at European Space Research and Technology Center (ESTEC)
languages:	German:	native language
	English:	excellent knowledge, business fluent
	French:	business fluent
	Dutch:	good knowledge

Professional Background

2005-2020 **Eidgenössisches Institut für Metrologie METAS** (Swiss Federal Institut of Metrology)

The Federal Institut of Metrology (METAS) is the Swiss National Metrology Institut. It supervises the deployment of measuring instruments in the fields of commerce, traffic, public safety, health and environment.

2016- 2020 Senior Scientist at the Laboratory of Optics at METAS

2005-2016 Head of the Section Ionising Radiation and Thermometry

National responsibility for

- correct measurement of dosimetry of radiation cancer therapy, radioactivity and radiation protection
- Swiss federal laws for correct measurement of ionising radiation

Swiss representative

- of the Consultative Committee for Ionizing Radiation (CCRI) at the International Bureau of Weights and Measures (BIPM) in Paris
- EURAMET Technical Committee for Ionising Radiation

Personnel management and personnel development of 10 scientists and technicians in two laboratories. Managerial responsibility of two Swiss Designated Institutes at BIPM. Chairman of the following standards committees and member of the corresponding international ISO and IEC committees:

- Swiss INB Committee 118 (Nuclear Energy, ISO TC 85)
- Swiss IEC Technical Committee TC 45 (Nuclear Instrumentation)

R&D on dosimetry for radiation cancer therapy in the framework of the European Metrology Research Program of the European Commission

1995-2005 **GenSpec SA, Neuchâtel**

Founder, President and CEO of GenSpec SA

Analytical Instrumentation for Biotechnology and Pharmaceutical Industry

Total Investments CHF 15 mio and Grants CHF 2 mio, staff 15 employees

February 2004: Cryodetector Mass Spectrometer Project (Patents) sold to Comet AG, Flamatt. Member of Scientific Advisory Board of Comet Analytics, Consulting Contract

2000-2004: licensing and business development contract with Comet AG, development of engineering prototype Macromizer, user program at Chemistry Department of ETHZ, John Hopkins University, Baltimore USA and Vanderbilt University Medical Center, Nashville, USA.

1995-2000: setting up start-up of GenSpec SA, business plans, venture capital search demonstrating principle of operation at University of Neuchâtel and National Institute of Standards and Technology (NIST), Boulder, USA.

1995-2005 **Institut de Physique de l'Université de Neuchâtel**

Privat Docent at the Institut de Physique de l'Université de Neuchâtel

Head of the Cryodetector Biomolecule Mass Spectrometry Group

2 Postgraduates, 3 Graduate Students, 1 Technician.

Cryodetector development for biomolecule mass spectrometry, ion optics, physics of molecule launch from solid and liquid samples, improving mass resolution

R&D funding as Principal Investigator (SNF, MedTech KTI, ETH: total CHF 2.7 mio)

- 1991-1995 **Comet AG, Bern**
 Manufacturer of X-ray tubes for medical imaging and non-destructive-testing (250 employees).
 Head of Technology Group
 - organisation of the Technology Group with following duties:
 - analysing complex quality problems in production and providing solutions
 - supervising and carrying out product design verifications in the context of the quality assurance system (ISO 9001) and the European Conformity declaration (CE)
 - providing design software and training of the engineers.
- 1988-1991 **Institut de Physique de l'Université de Neuchâtel**
 Chef de Travaux in the group of Prof.J.-L.Vuilleumier and responsible for the Cryogenic Detector group.
 - X-ray detection via non thermal phonons with Sn-junctions
 - developing the Microwave Enhanced Bolometer
 - investigating vortex flow in strip detectors
 - supervising postgraduates, graduates.
 - lecturing at the University de Neuchâtel.
 - consulting for ESA (European Space Agency) on Nb-junction X-ray detectors.
- 1987-1988 **European Space Research and Technology Center (ESTEC) of ESA**
 in Noordwijk (Holland) as research scientist in the Astrophysics Division of the Space Science Department of the European Space Agency (ESA)
 - setting up a research group for the development of cryogenic X-ray detectors for X-ray astrophysics.
- 1986-1987 **Institut for Theoretical Physics at the University of Zürich**
 research assistant of Prof.G.Scharf
 - performing a quantum field theoretical calculation on a vector main frame computer.
- 1986 **Institut for High Energy Physics at the ETH in Zürich**
 research assistant in the group of Prof.H.Hofer
 - developing a detector for the L3 LEP experiment in CERN.
 - measurement runs at DESY in Hamburg.
 - lecturing assistant at ETH in Zürich.
- 1982-1986 **Swiss Institut for Nuclear Research (SIN)**
 research assistant of Dr.A.Zehnder and graduate student at the ETH of Prof.J.P.Blaser, director of SIN
 - developing a new X-ray detector on superconducting basis.
 - setting up the cryogenic detector laboratory at SIN.
 - lecturing assistant at ETH in Zürich.
- 1980-1982 **Institut for Astronomy at the ETH in Zürich**
 research assistant and graduate student of Prof.J.O.Stenflo
 - analysis of the linear polarized spectra of the sun.
 - lecturing assistant at ETH in Zürich.
- 1980 **Institut for Nuclear Physics at the ETH in Zürich**
 Diploma thesis in experimental physics in the group of Prof.V.L.Telegdi
 -optimizing an infrared laser detection system.

Selection of Publications:

"Cryogenic Detectors: Detection of Single Molecules" D.Twerenbold
Encyclopedia of the Human Genome, **Nature Publishing Group**, June 2003,
www.ehgonline.net

"Impact energy measurement in time-of-flight mass spectrometry with cryogenic microcalorimeters", G.C.Hilton, John M.Martinis, D.A.Wollman, K.D.Irwin, L.L.Dulcie, Daniel Gerber, Patrick M.Gillevet and Damian Twerenbold, **Nature**, Vol 391, (1998) 672

"Detection of single macromolecules using a cryogenic particle detector coupled to a biopolymer mass spectrometer", D.Twerenbold, J.-L.Vuilleumier, D.Gerber, A.Tadsen, B.van den Brandt and P.M.Gillevet, **Appl. Phys. Lett.** 68 (1996) 3503.

"Cryogenic Particle Detectors", D.Twerenbold, **Rep. Progr. Phys.** 59 (1996) 349-426.

"Superconducting Sn/Sn-oxide/Sn tunneling junctions as high resolution x-ray detectors", D.Twerenbold and A.Zehnder, **Journal of Appl.Phys.**, 61 (1987) 1.

"Nonequilibrium model of the superconducting tunneling junction x-ray detector", D.Twerenbold, **Phys.Rev.B**, 34 (1986) 7748.

Selection of Invited Talks:

4th Siena Meeting "From Genome to Proteome", Siena, 4-7 September, 2000	Siena (Italy)	September 2000
Ninth International Genome Sequencing and Analysis Conference, Hilton Head, 13-16 September, 1997	Hilton Head (USA)	September 1997
45 th ASMS Conference on Mass Spectrometry and Allied Topics, Palm Springs, 1-5 June, 1997	Palm Springs (USA)	June 1997

Selection of Patents:

"Mass Spectrometer for Macromolecules with Cryogenic Particle Detectors"
Damian Twerenbold
US Patent 5,640,010 issued 17 June 1997

"Micromechanically produced Nozzle for producing reproducible Droplets"
Ph.Luginbuhl, P.-F.Indermuhle, D.Twerenbold
US Patent 6,523,762 B1 issued 25 February 2003