ALPUG GmbH

ALPINE NATURAL HAZARDS
AVALANCHE AND PERMAFROST
DEVELOPMENT & RESEARCH
MEASURING +WARNING SYSTEMS

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Company profile

Dr. Hansueli Gubler, Physicist
22 years of research and consulting at SFISAR
Independent consultant for alpine natural hazards, risk analysis, safety concepts, snow and avalanche problems, permafrost, remote instrumentation, warning- and alarm systems.

Vita Dr. Hansueli Gubler, Physicist, Snow Scientist, Davos Switzerland

Born 2/12/45
Studies in experimental physics at the University of Zürich
Theses in low energy nuclear physics 1973.
Scientific collaborator at BYU, Provo, Utha
1973- 1994: Scientist at the Swiss Federal Institute for Snow and Avalanche Research. Research and development in general snow physics including snow metamorphism, electromagnetic properties of snow and snow mechanics; avalanche formation, avalanche dynamics, avalanche risks analyses, avalanche warning systems including remote instrumentation and data acquisition, temporary avalanche safety measures including artificial release of avalanches. Project leader in various projects. 30 scientific publications in various fields. Formation of avalanche professionals.
Since 1994 private consulting office for alpine natural hazards. Development and installation of new warning and alarm systems to support temporal measures for avalanche and mudflow safety.
Consultant for avalanche dynamics, hazard zoning and risk analyses, safety concepts for ski areas.
Training courses for avalanche professionals.
Member of IGS, professional member and honorary fellowship of AAAP, member of the APS.
Editor, member of papers committee for different scientific meetings
Scientific editor for the J. of Glaciology until 1993.
Regular lectures on snow physics at the Swiss Federal Technical High School ETHZ in Zürich since 1989.

Gubler, 2000

Main fields of work of AlpuG

- ***Risk analysis and safety concepts*** with respect to avalanches for ski areas, roads, railways.
- ***Planning of temporary measures*** to reduce risk: artificial release, remote measuring- and control systems.
- ***Consulting in avalanche dynamics***: runout and avalanche pressures, avalanche danger maps.
- ***LAWSIM™***: Software for avalanche flow simulation.

- ***Planning, delivery, installation and maintenance of remote instrumentation***, data acquisition and transmission systems, data visualisation for alpine warning systems (avalanches, mudflow, flooding, rockfall).

- ***Alarm systems*** for avalanches, mud-flows, rockfall.
  - ✓ Medium range motion detectors
  - ✓ Ground motion detectors
  - ✓ Dynamic forces
  - ✓ Mud flow detectors
  - ✓ Rockfall detectors
  - ✓ Crack extensometer

- ***Remote control*** for artificial avalanche release systems

- ***Special instrumentation and sensors***:
  - ✓ ***Sno*Surf** infrared snow surface temperature (weak layer formation).
  - ✓ ***Sno*Pro** remote snow profiler for release zones (snow accumulation, fracture height, layering, melt water percolation).
  - ✓ **Snow** height, radiation, temperature and humidity, wind, snow and ground temperatures.
  - ✓ ***Flow*Capt™** acoustical snow drift and wind measuring systerm.
  - ✓ ***Rain*Flow™** acoustical precipitation gauge.

    *Flow*Capt and *Rain*Flow are Trade Marks of IAV Engineering
  - ✓ ***Sno*Wet** TDR ground surface wetness (potential for gliding and full depth avalanches).
  - ✓ **Weak layer** formation at actual snow surface (model running on site).
  - ✓ **Temperature logging** in bore holes in Alpine and Arctic permafrost areas.

- ***More than 180 installations since 1995 by AlpuG***

Some major publications

GUBLER H., 1980, Simultaneous measurements of stability indices an characteristic parameters describing the snow cover and the weather in fracture zones of avalanches. J. of Glaciol. Vol. 26, No. 94, p. 65-74.

GUBLER H., Hiller, M., 1984, The use of microwave FMCW radar in snow an avalanche research. Cold Region Sci. & Techn. 9(2), p. 109-119.

GUBLER H., 1985, Model for dry snow metamorphism by interpracticle vapor flux. J. Geophys. Res. 90 (1985) D5, p. 8081-92.

GUBLER H., Weilenmann, P.,1986, Seasonal snow cover monitoring using FMCW radar. Proceedings of the International Snow Science Workshop, Lake Tahoe, USA 1986, p. 87-97.

GUBLER H., 1987, Measurements and modelling snow-avalanche speeds. In, Avalanche Formation, Movement and Effects, Proceedings of the Davos Symposium. IAHS Publ. No. 162, p. 405-420.

GUBLER H., Hiller M., Weilenmann P.,1988, Remote on-line snow cover profiling in avalanche release zones using miccrowave radar. Proceedings of the International Snow Science Workshop, Whistler, Canada, 1986, p. 166-174.

GUBLER H., Bader H.P., 1989, A model of initial failure of slab avalanche release. Annals of Glaciology, Vol. 13, Intl. Glac. Soc., p. 90-95.

GUBLER H., 1992, Slab avalanche formation, new measurements and results, Proceedings of the International Snow Science Workshop. Breckenridge, Colorado USA, p. 134-149.

GUBLER H.,1996, Remote avalanche warning-, alarm and control systems, fundamentals,

applications and experience. Proceedings of ISSW 96, Banff Canada, p. 165-172.

GUBLER H.,1998, A model to determine snow surface proporties from remote measurements, Proceedings of the International Snow Science Workshop 98, Sunriver, Oregon p. 35 - 48.

GUBLER H. 2000, 5years experience with avalanche-, mudflow-, and rockfall- alarm systems in Switzerland, Proceedings of the International Snow Science Workshop 2000, Big Sky, Montana.

Lecture notes on snow physics 1989 – 2000, ETH Zürich , 200p.

Articles for practitioners on artificial avalanche release, avalanche formation and snow mechanics, risk analyses and safety planning for ski areas roads and villages, supporting tools for decision making, remote warning and alarm systems, 12 articles in German, 1994 - 2000.