Short Resume **March 2009**

Gerhard H. JIRKA

Professor and Director
Institute for Hydromechanics
University of Karlsruhe

Higher Education

- Dipl.Ing.(with honors), Hochschule für Bodenkultur, Vienna, Austria, May 1969
- M.S., Massachusetts Institute of Technology (MIT), February 1971
- Ph.D., Massachusetts Institute of Technology (MIT), March 1973

Professional Experience

- Research Assistant, MIT, Department of Civil Engineering, 1969-1973
- Research Engineer, MIT, Energy Laboratory, and Lecturer, Department of Civil Engineering, 1973-1977
- Assistant, Associate, and Full Professor of Civil and Environmental Engineering, Cornell University, 1977-1995
- Founding Director, DeFrees Hydraulics Laboratory, Cornell University, 1984-1995
- **Professor and Director, Institute for Hydromechanics, University of Karlsruhe, 1995-present**
- **Associate Director, Center for Climate and Environment, Karlsruhe Institute of Technology (KIT), 2008 - present**

- Visiting Professor, Institute for Hydromechanics and Water Resources, Federal Institute of Technology (ETH), Zurich, Switzerland, 1983-1984
- Visiting Professor, Institute for Hydraulics and Hydrology, Technical University of Vienna, Austria, 1991-1992
- Visiting Professor, Department of Civil Engineering, University of Canterbury, New Zealand, September 1999-January 2000
- Visiting Scientist, Department of Civil and Environmental Engineering, MIT, Cambridge, Mass., USA, February/March 2000
- Visiting Scientist, Instituto Nacional del Agua (INA), Laboratorio de Hídraulica, Buenos Aires, Argentina, Oct. 2004 – March 2005

Registered Professional Engineer - State of New York, License No. 66739-1

Patents - United States Patent No. 3,934,599, Jirka et al., "Submerged Multiport Diffusers for Cooling Water Discharge"

Research Interests

- Fluid Mechanics: Transport phenomena, stratified flow, air-water transfer processes, turbulence, sediment transport, experimental techniques, hydraulic engineering, porous media flow
- Environmental Effects: Water quality models, groundwater flow and contamination, simulation methods, expert systems
- Energy: Waste heat disposal, fluid mechanical aspects of alternative energy systems, ocean thermal energy conversion, hydro-electric power

Professional Societies

- American Society of Civil Engineers (ASCE): Member since 1973; Chairman, Water Resources Engineering Division (formerly Hydraulics Division) 1990-91
- International Association for Hydraulic Research and Engineering (IAHR): Member since 1975; Vice-President 2005-09
- American Geophysical Union (AGU): Hydrology Section, Member since 1977
- Sigma Xi, The Scientific Research Society: Member since 1978
- Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall (DWA): Mitglied seit 1995
- Deutsche Forschungsgemeinschaft (DFG): Mitglied seit 1995
  Senatskommission für Wasserforschung (KOWA), Mitglied 1997 – 2003

Honors and Awards

- Fulbright Travel Grant, Austro-American Educational Commission, 1969-1971
- Freeman Hydraulics Prize, American Society of Civil Engineers (Boston Society of Civil Engineers Section), 1981
- Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers, 1983
- Clemens Herschel Award, Boston Society of Civil Engineers, 1983
- Distinguished Visitors Program, Faculty of Engineering, McGill University, 1984
- Arthur T. Ippen Award, International Association for Hydraulic Research, 1989
- Fellow, American Society of Civil Engineers, 1991
- Fulbright Scholar, United States Information Agency, 1991-92
- Choi Kin Chung Fellowship, 1991; William Mong Fellowship, 1998, University of Hong Kong
- Erskine Fellowship, University of Canterbury, New Zealand, 1999/2000
- Corresponding Member, National Academy of Exact, Physical and Natural Sciences, Argentina, 2004
- Hunter Rouse Hydraulic Engineering Award, American Society of Civil Engineers, 2006
- Listed in "Who is Who in Science and Engineering", "Who is Who in the World"

Consulting Engineer/ Founding Partner - MixSys GbR, Karlsruhe, Germany, http://www.mixsys.de

Conference Organization

- International Symposium on Gas Transfer at Water Surfaces, Ithaca, New York, June 13-15, 1983: Co-Convenor with W.H. Brutsaert (Cornell University)
- Third International Symposium on Stratified Flows, Pasadena, California, February 3-5, 1987: Co-Chairman with J.E. List (California Institute of Technology)
- 27th Congress of the International Association for Hydraulic Research (IAHR), San Francisco, California, August 11-15, 1997: Chairman of the U.S. planning committee (1991-1995)
- 28th Congress of the International Association for Hydraulic Research (IAHR), Graz, Austria, August 23-27, 1999: Co-Coordinator of Theme D (Environmental Hydraulics)
- International Symposium on Shallow Flows, Delft, Netherlands, June 16-18, 2003: Co-Convenor with W. Uijttewaal (Delft Technological University)
- 31th Congress of the International Association for Hydraulic Research (IAHR), Seoul, Korea, Sept.11-16, 2005: Co-Coordinator of Theme C (Protecting and Restoring the Aquatic Habitat)

Books and Invited Book Chapters (last 5 years)

Jirka, G.H., und Lang, C., 2004, Gerinnehydraulik, Skriptum (120 S.), Eigenverlag, Institut für Hydromechnik, Universität Karlsruhe

Jirka, G.H. and Uijttewaal, W. (Ed.s), 2004, Shallow Flows, A.A.Balkema Publishers, Rotterdam

Jirka, G.H. and Weitbrecht, V., 2005, „Mixing Models for Water Quality Management in Rivers: Continuous and Instantaneous Pollutant Releases", Water Quality Hazards and Dispersion of Pollutants, W. Czernuszensko and P. Rowinski, (Ed.s), Springer, New York

Herlina, and Jirka, G.H., 2007, "Turbulent gas flux measurements at the air-water interface in a grid-stirred tank", Ch.2 in Transport at the Air-Sea Interface (C.S. Garbe, R.A. Handler and B. Jähne,Ed.s), Springer, Berlin, Heidelberg, New York

Kühn, G. and Jirka, G.H., 2007, "Fine sediment behavior in open channel turbulence: an experimental study", Section 3.4 in Sediment Dynamics and Pollutant Mobility in Rivers: An Interdisciplinary Approach (Westrich, B. and Förstner, U., Ed.s), Springer, Berlin, Heidelberg, New York

Jirka, G.H., and Herlina, 2008, "Reaeration", in Encyclopedia of Ecology, S.E. Jorgensen and B.D. Faith (Ed.s). Vol. 4, 2875-81

Refereed Journal Publications (last 5 years)

Jirka, G.H., 2004, „Integral Model for Turbulent Buoyant Jets in Unbounded Stratified Flows. Part 1: The Single Round Jet“, Environmental Fluid Mechanics, Vol. 4, 1-56.

Jirka, G.H., Bleninger, T., Burrows, R., and Larsen, T., 2004, "Environmental Quality Standards in the EC-Water Framework Directive: Consequences for Water Pollution Control for Point Sources", European Water Management Online, European Water Association

Doneker, R.L., Nash, J.D., and Jirka, G.H., 2004, "Pollutant Transport and Mixing Zone Simulation of Sediment Density Currents", J. Hydraulic Engineering, Vol. 130, 4, 349-359.

Doneker, R.L., and Jirka, G.H., 2004, Discussion of "Sensitivity Analysis and Comparative Performance of Outfalls with Single Buoyant Plumes" by M.A. Economopoulou, A.A. Economopoulou, and A.P. Economopoulous, J. Environmental Engineering, Vol.130

Socolofsky, S.A., and Jirka, G.H., 2004, "Large Scale Flow Structures and Stability in Shallow Flows", J. Environmental Engineering and Science, Can. Soc. Civ. Eng., 3, 451-462

Herlina, and Jirka, G.H., 2004, "Application of LIF to Investigate Gas Transfer near the Air-Water Interface in a Grid-Stirred Tank", Experiments in Fluids, 37, 341-349

Jirka, G.H., Bleninger, T., Burrows, R., and Larsen, T., 2004, "Management of point source discharges into rivers. Where do Environmental Quality Standards in the new EC-Water Framework Directive Apply?", J. River Basin Management, Vol.3, 2

Negretti, M.E., Rummel, A.C., Socolofsky, S.A., and Jirka, G.H., 2005, "Stabilization of cylinder wakes in shallow water flows by means of roughness elements: An experimental study", Experiments in Fluids, 38, 4, 403-414

Rummel, A.C., Socolofsky, S.A., v.Carmer, C.F., and Jirka, G.H., 2005, "Enhanced diffusion from a continuous point source in shallow flow with grid turbulence", Physics of Fluids, 17, 075105-1-12

Jirka, G.H., 2006, „Integral Model for Turbulent Buoyant Jets in Unbounded Stratified Flows. Part 2: Plane Jet Dynamics Resulting from Multiport Diffuser Discharges“, Environmental Fluid Mechanics, 6: 43-100

Jones, G.R., Nash, J.D., Doneker, R.L., and Jirka, G.H., 2007, "Buoyant Surface Discharges into Water Bodies. I: Flow Classification and Prediction Methodology", J. Hydraulic Engineering, Vol. 133, Nr. 9, 1010-20

Jirka, G.H., 2007, "Buoyant Surface Discharges into Water Bodies. II: Jet Integral Model", J. Hydraulic Engineering, Vol. 133, Nr. 9, 1021-36

Nikora, V., Nokes, R., Veale, W., Davidson, M., and Jirka, G.H., 2007, "Large-scale turbulent structure of uniform shallow free-surface flows", Environmental Fluid Mechanics, 7(2), 159-172

Bleninger, T., and Jirka, G.H. , 2007, „First steps in modelling and design of coastal brine discharges“, Desalination & Water Reuse, 17, 2, 48-61

Negretti, M.E., Zhu, D.Z. and Jirka, G.H., 2007, „Barotropically induced interfacial waves in stratified exchange flow over a smooth sill", J. Fluid Mechanics, 592, 135-153

Jirka, G.H., 2008, "Improved Discharge Configurations for Brine Effluents from Desalination Plants", J. Hydraulic Engineering, Vol. 134, Nr. 1, 116-120

Herlina, and Jirka, G.H., 2008, "Experiments on Gas Transfer at the Air-Water Interface Induced by Oscillating Grid Turbulence", J. Fluid Mechanics, 594, 183-208

Bleninger, T., and Jirka, G.H. , 2008, „Modelling and environmentally sound management of brine discharges from desalination plants", Desalination, 221, 585-597

Weitbrecht, V., Socolofsky, S.A., and Jirka, G.H., 2008, „Experiments on Mass Exchange between Groin Fields and the Main Stream in Rivers", J. Hydraulic Engineering, Vol. 134, Nr. 2, 173-183

Negretti, M.E., Jirka, G.H., and Zhu, D.Z, 2008, „The effect of bottom roughness in two-layer flows down a slope", Dynamics of Atmosphere and Oceans, 45/1-2, 46-68

Carmer, C.F.v., Rummel, A.C., and Jirka, G.H., 2009, "Mass transport in shallow turbulent wake flow by planar concentration analysis", J. Hydraulic Engineering, Vol. 135, Nr.4, 257-270

Bleninger, T., Lattemann, S., Purnama, A., Al-Barwani, H.H., Doneker, R.L, and Jirka, G.H., 2009, „BrineDis – Environmental planning, prediction and management of brine discharges from seawater desalination plants", Arab Water World, Vol.33, Nr.4, 6-10

Kadota, A., Suzuki, K., Rummel, A.C., Weitbrecht, V., and Jirka G.H., 2009, „Shallow Flow Visualization Around a Single Groyne", Experiments in Fluids, (submitted)

Delbos, S., Weitbrecht, V., Bleninger, T., Grand, P.P., Chassaing, E., Lincot, D., Kerrec, O., and Jirka, G.H., 2009, "Homogeneous turbulence induced at an electrodeposition surface by randomly firing jet arrays", Experiments in Fluids, (accepted)

Brevis, W., Niño, Y., and Jirka, G.H., 2009, "On the integration of cross-correlation and relaxation algorithms for Particle Tracking Velocimetry: The ICCRM method", Experiments in Fluids, (accepted)

Detert, M., Weitbrecht, V.,, and Jirka, G.H., 2009, "Laboratory Measurements on Turbulent Pressure Fluctuations In and Above Gravel Beds", J. Hydraulic Engineering, (submitted)

Detert, M., Nikora, V.,, and Jirka, G.H., 2009, "Synoptic Velocity and Pressure Fields at the Water-Sediment Interface of Streambeds", J. Fluid Mechanics, (submitted)