A nonintrusive auto-transformer technique for the measurement of void fraction
Kendoush A.A. & Sarkis Z.A., *Experimental Thermal and Fluid Science*, 1996, 13/2 (92-97). In English.
Winding low resistance wires around the tube of the test section in a method analogous to the auto-transformer winding was proved experimentally successful for the measurement of void fraction in the two-phase medium inside the tube. This novel technique is based upon the fact that the two-phase mixture becomes the region for a magnetic field where any change in the void fraction produces a change in the permeability of the two-phase mixture. The present technique is suitable for two-phase flows, which are contained in nonmetallic tubes.

Two-phase flow behind a shock wave with phase transitions and chemical reactions
Smirnov N.N., Zverev N.I. & Tyurnikov M.V., *Experimental Thermal and Fluid Science*, 1996, 13/1 (11-20). In English.
A theoretical and experimental study was undertaken of the shock wave propagation in heterogeneous media containing an oxidant in the gaseous phase and a fuel in the condensed phase. A system of governing equations with boundary conditions is composed that makes it possible to simulate numerically the initiation of detonation and the acceleration and slowing down of an unsteady wave to a self-sustaining regime. Experiments were carried out in a shock tube for pure gas, for inert dispersed droplets, and for combustible dispersed droplets. The comparison of the results shows good agreement of theoretical and experimental data.

Development of local two-phase flow parameters for vertical bubbly flow in a pipe with sudden expansion
Rinne A. & Loth R., *Experimental Thermal and Fluid Science*, 1996, 13/2 (152-166). In English.
Experimental data are presented for vertical air-water bubbly flow obtained by fiber-optic sensors in a pipe with sudden expansion (40 mm to 90 mm). The local void fraction, local bubble velocity, local bubble frequency, bubble chord length, bubble size, and local interfacial area concentration were determined. Main emphasis is put on the local interfacial area concentration. The calculation of the surface area was based on different bubble shapes. The calculated distribution of bubble sizes depends on the chord length resulting from the product of measured bubble velocity and bubble residence time at the sensor tip. The values for the interfacial area concentration for flows with low void fractions ($\alpha \leq 0.04$) agree well with those measured by assuming only spherical bubbles. The existing deviations for flows with void fractions above $\alpha = 0.04$ seem reasonable according to the differently assumed bubble shapes in the determination methods. This leads to an increase in the values for the interfacial area concentration.

Electrokinetically enhanced vacuum dewatering of mineral slurries
Gopalakrishnan S., Mujumdar A.S., Weber M.E. & Pirkonen P.M., *Filtration and Separation*, 1996, 33/10 (929-932). In English.
Vacuum dewatering of titanium oxohydrate and pyrite slurries was enhanced electrokinetically through application of a constant DC voltage across the bed. The power was applied either continuously or in an interrupted mode, with the electrodes short-circuited during the periods of power interruption. The interrupted mode removed more water than continuous power, with a lower consumption of energy. Additional water could be removed in the interrupted mode by adding base at the anode to neutralise the acidity produced by the reaction at the anode when the power was on.

Error analysis based development of a bubble velocity measurement chain
Rossi G.L., *Flow Measurement and Instrumentation*, 1996, 7/1 (39-47). In English.
In this paper a measurement chain for bubble velocity measurements has been designed, developed and tested. The sensing element used for testing is a double fiber optic probe. Error sources associated with the measurement techniques are illustrated by theoretical models. The conclusions are also valid for other sensing elements used to detect bubbles in two-phase flow. A special purpose data acquisition and processing system has been implemented to obtain velocity data from the sensor signals.

Nuclear magnetic resonance (NMR) two-phase mass flow measurements
Kruger G.J., Birke A. & Weiss R., *Flow Measurement and Instrumentation*, 1996, 7/1 (25-37). In English.
An NMR measurement method for highly-turbulent liquid-gas two-phase flow has been developed in this laboratory. It allows measurement of the liquid velocity and of the fraction, both averaged over the inner volume of the NMR RF coil and over the measuring time. By signal-averaging, it is possible to extend the averaging time to mins, or even hrs or days. This time-averaging improves the signal relative to background noise as well as to fluctuations caused by the flow and hence improves the accuracy of the measurements. The influence of insufficient mixing of the spins during the polarization period is discussed.

Effect of homogeneous condensation on the dynamics of a hot vapor bubble in a cold liquid jet
Ocheretyanyi S.A. & Prokof'ev V.V., *Fluid Dynamics*, 1996, 31/6 (842-847). In English.
The problem of initiating cavitation bubbles in a cold liquid jet by injecting hot steam into high-pressure zone especially organized at the nozzle outlet is considered. Previously a plane flowfield in which vapor bubbles were formed at the cusp of the cavity (high-pressure zone) and propagated together with the liquid along the axis of symmetry was considered. In certain cases, in the bubble expansion process the vapor temperature drops below the saturation temperature. Vapor condensation in the bubble volume (homogeneous condensation) is also taken into account.

Calculation of axisymmetric cavities downstream of a disk in subsonic compressible fluid flow
Vasin A.D., *Fluid Dynamics*, 1996, 31/2 (240-248). In English.
Cavitation subsonic water flow past a disk is calculated in accordance with the Riabouchinsky scheme by a finite-difference method at Mach numbers $M \leq 0.95$ and cavitation number $\alpha \tilde{} 0.02$. The calculated results are compared with the data of slender body theory and the results obtained from some approximate formulas.