

## Keyword index to volume 27

- Absorption, 290  
Acoustics, 730  
Active separation control, 748  
Adverse pressure gradient, 967  
Aero-acoustics, 229  
Algebraic model, 653  
Anisotropy of Reynolds normal stresses, 204  
Annular jets, 911  
Annular reactor hydrodynamics, 1043  
Annular thermosyphon, 154  
Approximate deconvolution, 594  
Arbitrary rotating axes, 838  
Atmospheric boundary layer, 534  
Average Nusselt number, 456  
Axisymmetric diffusers, 319  
Bioreactors, 298  
Birefringent flows, 1054  
Bluff bodies, 748  
Boundary layer, 416, 445, 566, 811, 902  
Boundary layer separation, 721  
Boundary-layer flows, 777  
Budget of transport equation, 895  
Buffet, 661  
Buoyancy, 502  
Buoyant effect, 671  
CFD, 105, 684, 1043  
Channel, 167  
Channel flow, 65, 585, 945, 955  
Channel flows, 748  
Coalescence, 937  
Coherent structure, 967  
Coherent structures, 416, 911, 945  
Collision rate, 937  
Compressibility, 895  
Compressibility effects, 696  
Compressible boundary layer, 542  
Compressible flow, 594  
Computational fluid dynamics, 267  
Computer modelling, 1054  
Condensate flow, 220  
Confinement, 33  
Conjugate heat transfer, 867  
Control, 756  
Convective heat transfer, 445  
Cooled pipe, 220  
Cooling, 290  
Coriolis forces, 351  
Corrugated duct, 21  
Cube, 80  
Cylindrical coordinate system, 811  
DES, 391, 707, 1028  
Detached eddy simulations (DES), 1, 351  
Developing flow, 371  
Dimensionless flow displacement amplitude, 144  
Direct numerical simulation, 636, 696, 838, 902, 994  
Discrete tone noise, 229  
Dispersion, 181  
DNS, 65, 887  
Drag reduction, 259, 878  
Drag-reduction, 887  
Drop impact, 105  
Droplet, 181, 290  
Droplet evaporation, 424  
Duct flow, 243  
Eddy viscosity models, 831  
Effectiveness, 42  
Electronics, 391  
Embedded LES, 1028  
Encapsulation, 298  
Enhancement, 259  
Entrainment, 336  
Equilibrium states, 279  
Error estimation, 594  
Evaporation, 181  
EVM, 821  
Experiments, 1054  
Experiments in polymer drag reduction, 204  
Explicit algebraic model, 671  
Explicit filtering, 594  
Film cooling, 42  
Finite difference, 167  
Finite element method, 95  
Flat plate, 436  
Flow acceleration measurement, 558  
Flow boiling heat transfer, 514  
Flow separation control, 707  
Flow structure, 336  
Flow structures, 42  
Flow visualization, 21  
Foams, 298  
Forced convection, 33  
Forcing term, 1028  
Four-way coupling, 945  
Free convection, 811  
Free-surface flows, 95  
Friction factor, 144, 955  
Giesekus model, 887  
Heat and mass transfer, 424  
Heat transfer, 105, 259, 290, 298, 391, 476, 671, 852, 967  
Helical instability, 192  
Hemispherical ribs, 1010  
Heterogeneous nucleation, 220  
High resolution LES, 800  
High temperature, 445

- High-order filtering, 603
- Homogeneous flow, 279
- Horizontal pipe flow, 611
- Horseshoe vortex, 522
- Hot- and cold-wire measurement, 967
- Hybrid LES–RANS, 789
- Hybrid LES–RANS, 1028
- Hybrid RANS/LES, 777, 800
- Identification, 416
- Immersed-boundary method, 994
- Impinging jet, 33
- Inclined bank of cylinders, 311
- Inelastic collisions, 945
- Inflow boundary conditions, 585
- Inflow conditions, 576
- Inlet boundary conditions, 1028
- Instabilities, 878
- Instability, 336
- Internal heat generation, 466
- Irreversible loss coefficient, 319
- Isosceles triangular enclosure, 476
- Jet, 603
- Jet in cross flow, 42
- Jet in cross-flow, 402
- Jets, 336
- $k$ - $\varepsilon$  Model, 955
- $k$ - $\varepsilon$  Turbulence model, 476
- Karman, 181
- Kinematic simulation, 644
- Kinetic equation, 937
- Kinetic Reynolds number, 144
- Laminar flow, 319
- Large eddy simulation, 54, 267, 371, 576, 603, 911, 924
- Large-eddy simulation, 402, 551, 585, 627, 777, 811, 945
- Large-eddy-break-up device, 902
- Large-eddy-simulation, 594
- Laser Doppler measurements, 924
- Laser-Doppler velocimeter, 980
- Laser Doppler velocimetry/anemometry, 558
- Lattice-Boltzmann equation, 456
- LDA, 192
- LES, 229, 243, 391, 707, 811, 1028
- Liquid displacement in tubes, 95
- Liquid film, 329
- Lubrication, 329
- Martinelli parameter, 514
- Mass transfer, 290
- Measurement method, 737
- Mesh dependency, 1043
- Micro-PIV, 1069
- Micro-reactor, 1069
- Microbubble drag reduction, 436
- Microbubbles, 298
- Microchannel, 123
- Microfluidics, 1069
- Microphone array, 730
- MicroPIV, 123
- Mixed convection, 371, 490
- Mixing layer, 576
- Model constraints, 831
- Modeling the baroclinic term, 696
- Moist air, 220
- Naphthalene sublimation technique, 21
- Natural circulation loop, 154
- Natural convection, 167, 445, 456, 466, 476, 811
- Near wall, 653
- Near-wall simulation, 789
- Negative turbulence production, 994
- Neural network, 1061
- Neutral boundary layer, 627
- Non-equilibrium free shear layer, 737
- Non-Newtonian fluids, 329
- Non-Newtonian liquids, 95
- Nonlinear data analysis, 267
- Nonlinear eddy diffusivity model, 671, 838
- Numerical, 167, 319
- Numerical research, 154
- Numerical simulation, 895
- Numerical simulations, 800
- Offset strip fins, 514
- Oil droplets, 611
- Open channel flow, 1010
- Open-cell metal foam, 144
- Oscillating channel, 821
- Oscillating flow, 144
- Oscillatory blowing/suction, 707
- Particle image velocimetry, 445, 576, 748, 1010
- Particle-laden flow, 945
- Particle-laden turbulent flow, 619
- Partitioned cavity, 466
- Partitions, 456
- Passive scalar, 402
- Pilot jet, 911
- Pipe flow, 204
- PIV, 42, 192, 522, 730, 768, 1043
- Plate fin and tube heat exchanger, 522
- Plume, 502
- Porous, 259
- Porous media, 298, 955
- Precessing vortex core, 192, 636
- Pressure drop, 144, 311
- Pressure fluctuations, 902
- Pressure gradient, 566
- Pressure–velocity correlation, 768
- Primary surface heat exchanger, 21
- Principle of independence, 311
- Proper orthogonal decomposition, 416
- Protein separation, 298
- RANS, 391, 661
- Reactive scalar dispersion, 627
- Rectangular channel, 514
- Reynolds number factor, 514
- Reynolds stress, 768
- Reynolds stress models, 831
- Reynolds stress transport, 558
- Reynolds-number scaling, 566
- Rheological parameters, 887
- Rheology, 298
- Ribbed channel flow, 391
- Ribbed channels, 243
- Ribbed ducts, 1, 351
- Rod roughness, 65
- Rotating disk, 551
- Rotating disk flow, 329
- Rotating square duct, 371
- Rotation, 644, 653
- Rotational flow, 838
- Rough wall, 852
- Scalar mixing, 636
- Second moment closure, 684
- Second-moment closure, 924
- Sensitivity analysis, 1061
- Shear rate, 1054
- Shell and tube, 811

- Shock-induced oscillations, 661
- Shocklets, 895
- Simulation, 105
- Single-particle dispersion, 644
- Sintered medium, 259
- Slip conditions, 329
- Solenoidal dissipation rate equation, 696
- Spatially decaying isotropic turbulence, 585
- Spatially developing mixing layer, 895
- Spiral type, 192
- Spontaneous Raman scattering, 636
- Spot merging, 542
- Spray impingement, 105
- Spray modelling, 424
- Square cylinder, 167
- Stagnation region heat transfer, 1061
- Statistical model, 937
- Statistical unsteadiness, 756
- Stochastic modelling, 867
- Stratification, 279, 644
- Stratified flow, 490
- Stress-strain alignment, 821
- Strongly swirled flow, 636
- Structure based, 653
- Subgrid model, 603
- Subgrid stochastic model, 627
- Subgrid-scale model, 229
- Surface pressure, 730
- Surfactant, 887
- Swirl, 502, 611
- Swirl combustor, 924
- Swirling annular inflow, 924
- Swirling jets, 911
- Synthesized turbulence, 1028
- Synthetic jet, 756
- Synthetic turbulence, 585
- Taylor-Görtler vortex, 21
- Temperature distribution, 476
- Thermal convection, 154
- Thermal energy storage, 490
- Thermal fluctuations, 867
- Thermal striping, 54
- Three-dimensional boundary layer, 980
- Three-dimensional boundary layers, 551
- Three-level decomposition, 768
- Trailing edge, 730
- Trailing vortex, 684
- T-RANS, 800
- Transition, 80, 123, 721, 878
- Transition to turbulence, 542
- Turbine blade internal cooling, 1, 351
- Turbines, 721
- Turbulence, 54, 123, 351, 502, 551, 566, 644, 671, 838, 937, 945, 980, 994
- Turbulence control, 902
- Turbulence model, 204
- Turbulence modeling, 653
- Turbulence modelling, 661, 756, 831, 838, 852, 924
- Turbulence models, 684, 1043
- Turbulence modification, 611
- Turbulence modulation, 945
- Turbulence structure, 65, 558
- Turbulent acceleration, 558
- Turbulent boundary layer, 534, 967
- Turbulent boundary layers, 558
- Turbulent flow, 279, 445, 522, 789
- Turbulent heat flux, 967
- Turbulent heat transfer, 371
- Turbulent inflow condition, 902
- Turbulent spots, 542
- Turbulent thermal convection, 800
- Turbulent wake, 768
- Two-equation turbulence model, 671
- Two-layer model, 789
- Two-particle dispersion, 644
- Two-phase CFD, 424
- Two-phase flow, 937
- Two-phase frictional multiplier, 514
- Unsteadiness, 661
- Unsteady, 181
- Unsteady mixing, 490
- URANS, 192, 756, 768, 821
- V2F, 653
- Vaporization, 290
- Variable unit cell length, 311
- Velocity distribution, 476
- Velocity-pressure correlation, 737
- Volume average, 955
- Vortex breakdown, 192
- Vortex generators, 902
- Vortex shedding, 80
- Vortex street, 181
- Vortex-shedding, 748
- Vorticity, 416
- Wake dissipation, 955
- Wakes, 80, 721
- Wall models, 267
- Wall roughness, 619, 1010
- Wall shear stress, 476
- Wall turbulence, 867
- Wall-function, 852
- Wind-tunnel-walls effect, 661
- Wing aerodynamics, 684
- Wing/body junction flow, 980
- Zonal model, 789