

# CV Igor V. Naumov (1970)

## Dr. Eng., PhD, RAS Professor

### Head Laboratory of Promising Efficient Technologies, NOVOSIBIRSK STATE UNIVERSITY

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### Degrees:

- 2013: Doctor of technical science (Dr.Eng.) in Institute of Thermophysics, Russian Academy of Science (IT SB RAS) Novosibirsk, Russia with the thesis title: "Formation and laser-optic diagnostic of the vortex structures in flows".
- 2000: Candidate of technical science (Ph.D.), in IT SB RAS, Novosibirsk, Russia. Thesis titled "Laser Doppler methods of the velocity measurements in the unsteady flows".
- 1992: Graduate of Novosibirsk State University, Russia with specialises in Physics.

### Academic qualifications:

- 2016: Academic status of Professor RAS with specialty on energy and experimental fluid mechanics granted by Presidium of Russian Academy of Science.
- 2005: Academic status of Docent (Senior Scientist) with specialty on experimental fluid mechanics granted by the State Committee of National Education of the Russian Federation.

### Positions:

- 2022-present: *Head Laboratory of Promising Efficient Technologies at the Novosibirsk State University, Novosibirsk, Russia.*
- 2023-present: *Chief Researcher, Institute of thermophysics (IT SB RAS), Russia.*
- 2019-present: *Principal Research Scientist, Institute of thermophysics (IT SB RAS), Russia.*
- 2019-present *Principal Research Scientist at the Novosibirsk State University, Novosibirsk, Russia.*
- 2002- 2018: *Senior Research Scientist, IT SB RAS, Russia.*
- 1999-2002: *Research Scientist, IT SB RAS, Russia.*
- 1996-1999: *Post-graduate Student, IT SB RAS, Russia.*
- 1992-1996: *Engineer, Institute of Nuclear Physics, Russian Academy of Science, Novosibirsk, Russia*

### Scientific focus areas:

Experimental fluid mechanics, heat and mass transfer, especially on vortex flows and optical methods like Laser Doppler Anemometry (LDA) and Particle Image Velocimetry (PIV). Cases of interest include aerodynamic of turbo machines, hydro and wind turbines; biotechnology application – vortex bioreactors, hydrodynamics instability and physical processes in swirl flows (vortex breakdown), vortex dynamic.

### Academic awards and honours:

- 2015: Laureate of Russian Federation Government Prize in the field of science and technology.
- 2012: Medal of academician G.I. Petrov, Prize of the Russian national committee of theoretical and applied mechanics for outstanding results in hydrodynamic instability and turbulence.

2021: Member of Expert Council for Presidential research funding program of Russian Science Foundation.  
2017: Member of the Joint Scientific Council on Energy, Mechanics and Control processes, SB RAS.  
2014: Expert of Russian Academy of Science and Russian Science Foundation (Fluid mechanics area).  
2020: Honorary diploma Siberian Branch of Russian Academy of Science (SB RAS).  
2018: Honorary title "Honored Veteran of SB RAS".  
2004-05: INTAS Grant for Young Scientists INTAS Ref Nr. 03-55-571 Post-Doctoral Fellowship, DTU DK.  
2003: Fellowship for young Candidate of science (Ph.D.) granted by President RF (MK-20.2003.08).

Member of Euromech,

Reviewer: Physics of Fluids, Experiments in Fluids, Fluid Dynamic Research, Journal of Solar Energy Engineering, Thermophysics and Aeromechanics.

### **International relations:**

2020- present: Member of the international consortium (Norway, Russia, China, Japan and Canada) to study the icing of structures in cold regions.  
2021- present: Member of organizing committee of the "Siberian Thermophysical Seminar" conferences.  
2020: Deputy chair of Organizing Committee of the "XXXVI Siberian Thermophysical Seminar" dedicated to the 70th anniversary of Academician of the Russian Academy of Sciences S.V. Alekseenko.  
2018: Member of committee "4th International Retreat on Vortical Flow and Aerodynamics" (IRVA4).  
2016: Member of committee EUROMECH Colloquium 581 "Dynamics of Concentrated Vortices".  
2005-2017: Visiting Researcher, Visiting Professor, Fluid Mechanics Section of Denmark Technical University, Denmark (~ 2 – 3 Months per year).

### **Research Projects and grants for last 5 years:**

Coordinator:

2021 – 2023: Grant Russian Science Foundation (RSF) № 19-19-00083 -P "Basic research for the creation of two-fluid centrifugal mass and heat exchangers".  
2021: Grant Russian Foundation of Basic Research (RFBR Novosibirsk №20-48-540005 "Development of the scientific technology of the vortex mixing for biotechnologies".  
2019 – 2021: Grant Russian Science Foundation (RSF) № 19-19-00083 "Basic research for the creation of two-fluid centrifugal mass and heat exchangers".  
2018 – 2020: Grant Russian Foundation of Basic Research (RFBR) № 18-08-00508 "Regularities of the vortex cellular in one - and two-component immiscible liquids".  
2017 - 2019: Grant RFBR № 15-08-00186 "Experimental investigation of self-organizing vortex structures in the closed hydro flows".

Key Researcher:

2020-2022: Participant of the project "Development of a joint academic research program for the study of icing structures in cold regions" supported by the Research Council of Norway.  
2019-2021: Participant of the NSU Megagrant under the contract with the Ministry of Education and Science of the Russian Federation (No. 075-15-2019-1923) (team leader).  
2019 – 2024: Grant RSF № 19-79-10217 "Investigation of problems of occurrence and control of hydrodynamic cavitation at mini- and microscale".

### **Selected publications in peer-reviewed for the last 5 years (Q1):**

1. Salnikov M., Vozhakov I., Naumov I.V., Mullyadzhanov R. Swirling flow of two immiscible fluids in a cylindrical container: Lattice Boltzmann and Volume of Fluid study// **Physics of Fluids**. 2024. Vol 36 (1). 013601. DOI: 10.1063/5.0174747, IF=4.6.
2. Naumov I.V., Gevorgiz R.G., Skripkin S.G., Tintulova M.V., Tsoi M.A., Sharifullin B.R. Experimental study of the topological flow transformations in an aerial vortex bioreactor with a floating washer // **Biotechnology Journal**. 2023. 18, 2200644. DOI:10.1002/biot.202200644, IF=4.7.
3. Naumov I.V., Gevorgiz R.G., Skripkin S.G., Tintulova M.V., Tsoy M.A., Sharifullin B.R. Topological flow transformations in a universal vortex bioreactor // **Chemical Engineering and Processing - Process Intensification**. 2023, Vol. 191, 109467. DOI:10.1016/j.cep.2023.109467, IF=4.3.
4. Naumov I.V., Skripkin S.G., Kvon A., Shtern V.N. Changing interface conditions in a two-fluid rotating flow // **Physics of Fluids**. 2023. Vol 35 (3). p. 031705. DOI: 10.1063/5.0141821 IF=4.6.
5. Sharifullin B.R., Skripkin S.G., Naumov I.V., Zuo Z., Li B., Shtern V.N. Intense Vortex Motion in a Two-Phase Bioreactor // **Water**. 2023. N 15(1), 94. <https://doi.org/10.3390/w15010094>.
6. Naumov I.V., Skripkin S.G., Gusev G.E., Shtern V.N. Hysteresis in a two-liquid whirlpool // **Physics of Fluids**. 2022. Vol 34(3). p. 0320108. DOI: 10.1063/5.0083683 IF=3.521.
7. Okulov V.L., Sharifullin B.R., Okulova N., Kafka J., Taboryski R., Sørensen J.N., Naumov I.V. Influence of nano- and micro-roughness on vortex generations of mixing flows in a cavity // **Physics of Fluids**. 2022. Vol 34(3). p. 032005. DOI: 10.1063/5.0083503 IF=3.521.
8. Naumov I.V., Skripkin S.G., Shtern V.N. Counter flow slip in a two-fluid whirlpool // **Physics of Fluids**. 2021. Vol 33(6). p.061705. DOI: 10.1063/5/0055355 IF=3.521.
9. Skripkin S.G., Sharifullin B.R., Naumov I.V., Shtern V.N. Dual vortex breakdown in a two-fluid whirlpool // **Scientific reports**. 2021. Vol. 11. p.23085. DOI: 10.1038/s41598-021-02514-6 IF= 4.38.
10. Okulov V.L., Naumov I.V., Kabardin I.K., Litvinov I.V., Markovich D.M., Mikkelsen R.F., Sørensen J.N., Alekseenko S.V., Wood D.H. Experiments on line arrays of horizontal-axis hydroturbines. **Renewable Energy**. 2021. Vol. 163 p. 15-21. IF = 6.274.
11. Alekseenko, S.V., Anufriev, I.S., Dekterev, A.A., Shadrin, E.Y., Kuznetsov, V.A., Sharypov, O.V., Boyko, E.E., Naumov, I.V., Kabardin, I.K., Investigation of transfer processes in swirling flows in application to vortex furnaces for coal fuel // **International Journal of Thermal Sciences**. 2021. Vol. 161, p.106715. IF=3.476.
12. Naumov I.V., Sharifullin B.R., Tsoy M.A., Shtern V.N. Dual vortex breakdown in a two-fluid confined flow // **Physics of Fluids**. 2020. Vol 32(6), p.061706. DOI: 10.1063/5.0012156, IF = 3.514.
13. Naumov I.V., Sharifullin B.R., Kravtsova A. Yu., Shtern V.N. Velocity jumps and the Moffatt eddy in two-fluid swirling flows // **Exp. Thermal and Fluid Science**. 2020, Vol.116. 110116. IF= 3.493.
14. Carrión L., Naumov I.V., Sharifullin B.R., Herrada M.A., Shtern V.N. Formation of dual vortex breakdown in a two-fluid confined flow // **Physics of Fluids**. 2020. Vol 32(10), p.104107. IF=3.514.
15. Naumov I.V., Sharifullin B., Shtern V.N. Vortex breakdown in the lower fluid of a two-fluid swirling flow // **Physics of Fluids**. 2020. Vol. 32 (1). p.014101 DOI: 10.1063/1.5132584, IF = 2.627.
16. Naumov I.V., Sharifullin B.R., Tsoy M.A. Experimentally investigating the instability onset in closed polygonal containers // **Experiments in Fluids**, 2019. Vol. 60:178. IF: 2.447.
17. Naumov I.V., Glavniy V.G., Sharifullin B., Shtern V.N. Formation of a thin circulation layer in a two-fluid rotating flow // **Physical Review Fluids**. 2019, Vol.4 (5), 054702. IF= 2.421.
18. Okulov V.L., Kabardin I.K., Mikkelsen R.F., Naumov I.V., Sørensen J.N. Helical self-similarity of tip vortex cores // **Journal of Fluid Mechanics**. 2019. Vol. 859, p.1084-1097. IF:2.893

Total: **Journal peer-reviewed publications:** > 90; **H-index:** 16; **Patent:** 17; **Other publ.:** 250 + publications