Stanford



Matthias Ihme

Professor of Mechanical Engineering, of Photon Science and, by courtesy, of Energy Science and Engineering

CONTACT INFORMATION

- **Administrative Contact**

  Ria Tan - Administrator

  Email riatan@stanford.edu

  Tel (650) 497-4645

Bio

BIO

Large-eddy simulation and modeling of turbulent reacting flows, non-premixed flame, aeroacoustics and combustion generated noise, turbulence and fluid dynamics, numerical methods and high-order schemes.

ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Professor, Photon Science Directorate
- Principal Investigator, Stanford PULSE Institute

PROFESSIONAL EDUCATION

- Ph.D, Stanford University , Mechanical Engineering (2008)
- M.Sc., University of Erlangen, Germany , Computational Engineering (2002)
- Dipl.-Ing., Munich University of Applied Sciences, Germany , Mechanical Engineering (2000)

Teaching

COURSES

2026-27

- Advanced Fluid Mechanics Multiphase Flows: ME 451A (Win)
- Engineering Thermodynamics: ME 30 (Aut)
- Wildfire Science: ME 375 (Spr)

2025-26

- Engineering Thermodynamics: ME 30 (Win)
- Gas-Turbine Design Analysis: ME 257, ME 357 (Aut)

2024-25

- Engineering Thermodynamics: ME 30 (Aut)
- Turbulent Combustion: ME 471 (Win)

2023-24

- Advanced Fluid Mechanics Multiphase Flows: ME 451A (Aut)
- Engineering Thermodynamics: ME 30 (Win)
- Gas-Turbine Design Analysis: ME 257, ME 357 (Spr)
- Wildfire Science: ME 375 (Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Andres Arriagada Romero, Timoteo Dinelli, Karl Toepperwien, Taekeun Yoon

Doctoral Dissertation Advisor (AC)

Bassem Akoush, Blake Andersen, Shivansh Chaturvedi, Liu Deng, James Hansen, Benyamin Krisna, Nathan Laing, Sourav Das Suvro

Master's Program Advisor

Mert Yakup Baykan, Ryan Finley, Colette Fisher, Max Lunifeld, Abhiram Putta, Ebenezer Zhi Cong Quah

Doctoral (Program)

Mehmet Kagan Adigüzel, Aidan Hopp, Jin Lee, Spencer Schwartz, Wada Sho, Christopher Williams, Michelle Winham-Gee

Publications

PUBLICATIONS

- **Reduced-Order Model for Multijet Supersonic Retropropulsion** *JOURNAL OF SPACECRAFT AND ROCKETS*
  Wu, D. D., Topperwien, K., Ihme, M.
  2026
- **Quantification of preferential diffusion in turbulent premixed combustion: A species-specific Peclet number and tangential diffusion strain rate** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Chi, C., Ihme, M.
  2026; 42
- **Confinement-induced shift of thermodynamic response and energetic heterogeneities in supercritical fluids** *ENERGY*
  Fan, J., Ihme, M.
  2026; 360
- **Species-specific compliance indicator for diagnosis of combustion model fidelity** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Andersen, B., Ho, J., Ihme, M.
  2026; 42
- **CH₄ - H₂ combustion in a divergent porous media reactor: Experimental study and chemical reactor network modeling** *FUEL*
  Munoz-Herrera, C., Jeldres, L., Vignat, G., Nikrityuk, P. A., Ihme, M., Toledo, M.
  2027; 430
- **Experimental analysis and computational modeling of SiC oxidation in porous media burners** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Munoz-Herrera, C., Chaturvedi, S., Vignat, G., Toledo, M., Ihme, M.
  2026; 42
- **Examining fire-atmospheric coupling mechanisms in Pyrocumulonimbus clouds with high-resolution large-eddy simulations** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*

Wang, Q., Gazen, C., Ihme, M., Topperwien, K., Carver, R., Parker, J. B., Schneider, T., Chammas, S., Chen, Y., Anderson, J.
2026; 42

- **High-resolution in situ analysis of biomass pyrolysis by combining quantitative synchrotron μCT and 3D particle-resolved simulations** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Boigne, E., Ahmed, M. M., Foster, C., Toro, E. R., Parkinson, D. Y., MacDowell, A. A., Barnard, H. S., Panerai, F., Saggese, C., Ihme, M.
  2026; 42
- **High-resolution simulations reveal positive global warming feedback from Pacific low clouds.** *Science advances*
  Chammas, S., Wang, Q., Schneider, T., Carver, R., Shen, Z., Parker, J. B., Gazen, C., Ihme, M., Chen, Y. F., Anderson, J.
  2026; 12 (30): eaec8488
- **Hot surface ignition of synthetic aviation turbine fuels under well-controlled thermally stratified test conditions** *FUEL*
  Ma, Y., Vignat, G., Yoon, T., Zen, J., Cho, Y., Dinelli, T., Hashimoto, N., Corporan, E., Boze, J. A., V. Kosilkin, I., Damazo, J. S., Moravec, B. A., Boettcher, et al
  2027; 427
- **A general probabilistic approach for the analysis of cycle-to-cycle variations in internal combustion engines** *COMBUSTION AND FLAME*
  Engelmann, L., Ihme, M., Kempf, A., Bohm, B.
  2026; 287
- **Third-body stabilization of supercritical CO₂ in CO oxidation: development and application of a ReaxFF force field for the CO/O/CO₂ system** *FUEL*
  Chowdhury, E., Aryanpour, M., Shin, Y., Ramos-Alvarado, B., Ihme, M., van Duin, A. C. T.
  2027; 427
- **Dynamics of iodine geminate recombination in supercritical xenon solvent: Caging effect** *JOURNAL OF CHEMICAL PHYSICS*
  Mirakhory, M., Majumdar, A., Ihme, M., van Duin, A. T.
  2026; 164 (9)
- **Two-component dynamics in supercritical [Formula: see text] from inelastic X-ray scattering.** *Scientific reports*
  Majumdar, A., Sun, P., Singleton, M., Paolasini, L., Bosak, A., Baron, A. Q., Hastings, J., Ihme, M.
  2026
- **Nanoscale ultrafast lattice modulation with a free-electron laser** *NATURE PHYSICS*
  Li, H., Wang, N., Zhang, L., Song, S., Sun, Y., Ng, M., Sato, T., Hanlon, D., Dahal, S., Balcazar, M. D., Esposito, V., She, S., Ornelas-Skarin, et al
  2026
- **Extension of a spectral difference method for the diffused-interface five-equation model** *COMPUTERS & FLUIDS*
  Tonicello, N., Lodato, G., Ihme, M.
  2026; 304
- **Contributions of Acute Wildfire Smoke Exposure to Excess Mortality from the 2025 Los Angeles Fires** *ENVIRONMENTAL SCIENCE & TECHNOLOGY LETTERS*
  Topperwien, K., Yu, J., Ihme, M.
  2025
- **Deep reinforcement learning for adaptive control of thermoacoustic instabilities in a lean-premixed methane/hydrogen/air combustor** *COMBUSTION AND FLAME*
  Akoush, B., Vignat, G., Finley, R., Chung, W., Ihme, M.
  2025; 282
- **Physics-Based Model for Predicting Jet Plumes in Supersonic Retropropulsion** *JOURNAL OF SPACECRAFT AND ROCKETS*
  Wu, D. D., Topperwien, K., Wada, S., Ihme, M.
  2025
- **Learning chemical kinetics through data assimilation: Theory and application to ammonia oxidation** *CHEMICAL ENGINEERING JOURNAL*
  Dinelli, T., Stagni, A., Ihme, M.
  2025; 524

- **A self-consistent analysis of cluster morphology in supercritical carbon dioxide from Small Angle X-ray Scattering** *CHEMICAL PHYSICS LETTERS*
  Muhunthan, P., Majumdar, A., Younes, K., Vignat, G., Li, H., Rajkovic, I., Weiss, T., Sokaras, D., Ihme, M.
  2025; 876
- **Supercritical Ethanol-CO2 Mixtures Exhibit Microscopic Immiscibility: A Combined Study Using X-ray Scattering and Molecular Dynamics Simulations.** *The journal of physical chemistry letters*
  Fan, J., Yoon, T., Vignat, G., Li, H., Younes, K., Majumdar, A., Muhunthan, P., Sokaras, D., Weiss, T., Rajkovic, I., Ihme, M.
  2025: 7090-7099
- **A physics-informed machine learning approach for predicting dynamic behavior of reacting flows with application to hydrogen jet flames** *COMBUSTION AND FLAME*
  Sharma, P., Chung, W., Ihme, M.
  2025; 277
- **A staged deep learning approach to spatial refinement in 3D temporal atmospheric transport** *ARTIFICIAL INTELLIGENCE IN GEOSCIENCES*
  Fernandez-Godino, M., Chung, W., Gowardhan, A. A., Ihme, M., Kong, Q., Lucas, D. D., Myers, S. C.
  2025; 6 (1)
- **Iodine recombination in xenon solvent: Clusters in the gas to liquid-like state transition** *JOURNAL OF CHEMICAL PHYSICS*
  Mirakhory, M., Majumdar, A., Ihme, M., van Duin, A. T.
  2025; 162 (19)
- **Multi-modal effects on indirect noise induced by turbulent entropy fields** *JOURNAL OF FLUID MECHANICS*
  Brouzet, D., Krisna, B., Ihme, M.
  2025; 1010
- **Burn parameters affect PAH emissions at conditions relevant for prescribed fires** *ATMOSPHERIC POLLUTION RESEARCH*
  Topperwien, K., Vignat, G., Feinberg, A. J., Daube, C., Alton, M. W., Fortner, E. C., Canagaratna, M. R., Kling, M. F., Johnson, M., Nadeau, K., Herndon, S., Jayne, J. T., Ihme, et al
  2025; 16 (5)
- **On the importance of species immiscibility in mixing-layer dynamics at supercritical pressures** *INTERNATIONAL JOURNAL OF MULTIPHASE FLOW*
  Ly, N., Ihme, M.
  2025; 184
- **Examining fire spread dynamics in canyon terrain through physics-based modeling: Mechanisms of fire line rotation and non-local fire behavior** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Topperwien, K., Wang, Q., Chen, Y., Gazen, C., Anderson, J., Ihme, M.
  2025; 41
- **Shock-Induced Vanishing Dynamics of Water-Droplet Interface**
  Krisna, B., Ly, N., Ihme, M., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2025
- **Interface-Capturing Simulation of High-Pressure LOX/GH2 Mixing Layer**
  Ly, N., Ihme, M., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2025
- **Data assimilation of state-indirect observations for constraining detonation wave dynamics** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Hansen, J. J., Brouzet, D., Ihme, M.
  2025; 41
- **Heterogeneous Cluster Energetics and Nonlinear Thermodynamic Response in Supercritical Fluids.** *Physical review letters*
  Fan, J., Ly, N., Ihme, M.
  2024; 133 (24): 248001
- **Heterogeneous Cluster Energetics and Nonlinear Thermodynamic Response in Supercritical Fluids** *PHYSICAL REVIEW LETTERS*

Fan, J., Ly, N., Ihme, M.
2024; 133 (24)

- **Direct observation of ultrafast cluster dynamics in supercritical carbon dioxide using X-ray Photon Correlation Spectroscopy.** *Nature communications*
  Majumdar, A., Li, H., Muhunthan, P., Späh, A., Song, S., Sun, Y., Chollet, M., Sokaras, D., Zhu, D., Ihme, M.
  2024; 15 (1): 10540
- **A regularized-interface method as a unified formulation for simulations of high-pressure multiphase flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Ly, N., Ihme, M.
  2024; 518
- **Uncertainty quantification in coupled wildfire-atmosphere simulations at scale.** *PNAS nexus*
  Schwerdtner, P., Law, F., Wang, Q., Gazen, C., Chen, Y. F., Ihme, M., Peherstorfer, B.
  2024; 3 (12): pgae554
- **An enrichment wall modeling framework for spectral element methods** *PHYSICS OF FLUIDS*
  Brill, S. R., Pal, P., Ameen, M., Xu, C., Ihme, M.
  2024; 36 (12)
- **Stable supercritical interfaces do not exist without surface tension.** *Nature communications*
  Ly, N., Ihme, M.
  2024; 15 (1): 9353
- **Turbulence in disguise: Reactive flows in porous media mimic turbulent behavior** *PHYSICAL REVIEW FLUIDS*
  Boigne, E., Sobhani, S., Ferguson, J. C., Ihme, M.
  2024; 9 (10)
- **Mechanisms and models of the turbulent boundary layers at transcritical conditions** *PHYSICAL REVIEW FLUIDS*
  Li, F., Zhang, W., Ihme, M.
  2024; 9 (10)
- **A high-order diffused-interface approach for two-phase compressible flow simulations using a discontinuous Galerkin framework** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Tonicello, N., Ihme, M.
  2024; 508
- **Small-scale turbulent characteristics in transcritical wall-bounded flows** *JOURNAL OF FLUID MECHANICS*
  Li, F., Zhang, W., Bai, B., Ihme, M.
  2024; 986
- **Analysis of weak secondary waves in a rotating detonation engine using large-eddy simulation and wavenumber-domain filtering** *COMBUSTION AND FLAME*
  Vignat, G., Brouzet, D., Bonanni, M., Ihme, M.
  2024; 263
- **Mixtures Recomposition by Neural Nets: A Multidisciplinary Overview.** *Journal of chemical information and modeling*
  Nicolle, A., Deng, S., Ihme, M., Kuzhagaliyeva, N., Ibrahim, E. A., Farooq, A.
  2024
- **A versatile pressure-cell design for studying ultrafast molecular-dynamics in supercritical fluids using coherent multi-pulse x-ray scattering.** *The Review of scientific instruments*
  Muhunthan, P., Li, H., Vignat, G., Toro, E. R., Younes, K., Sun, Y., Sokaras, D., Weiss, T., Rajkovic, I., Osaka, T., Inoue, I., Song, S., Sato, et al
  2024; 95 (1)
- **Coupling of detonation structure and upstream inhomogeneities in a rotating detonation engine** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Bonanni, M., Brouzet, D., Vignat, G., Ihme, M.
  2024; 40 (1-4)

- **Examining diesel-spray assisted ignition of ammonia under reactivity-controlled conditions using large-eddy simulations** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Sharma, P., Brouzet, D., Chung, W., Ihme, M.
  2024; 40 (1-4)
- **Predictions of instantaneous temperature fields in jet-in-hot-coflow flames using a multi-scale U-Net model** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Kildare, J. A. C., Chung, W., Evans, M. J., Tian, Z. F., Medwell, P. R., Ihme, M.
  2024; 40 (1-4)
- **Integrated experimental and computational analysis of porous media combustion by combining gas-phase synchrotron μCT, IR-imaging, and pore-resolved simulations** *COMBUSTION AND FLAME*
  Boigne, E., Zirwes, T., Parkinson, D. Y., Vignat, G., Muhunthan, P., Barnard, H. S., MacDowell, A. A., Ihme, M.
  2024; 259
- **Artificial intelligence as a catalyst for combustion science and engineering** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Ihme, M., Chung, W.
  2024; 40 (1-4)
- **Analysis of residence time distribution in a cavity-stabilized scramjet combustor** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Bonanni, M., Norris, A., Ihme, M.
  2024; 40 (1-4)
- **Experimental demonstration of a two-stage porous media burner for low-emission ammonia combustion** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Vignat, G., Zirwes, T., Boigne, E., Ihme, M.
  2024; 40 (1-4)
- **A high-fidelity ensemble simulation framework for interrogating wildland-fire behaviour and benchmarking machine learning models** *INTERNATIONAL JOURNAL OF WILDLAND FIRE*
  Wang, Q., Ihme, M., Gazen, C., Chen, Y., Anderson, J.
  2024; 33 (12)
- **Augmenting filtered flame front displacement models for LES using machine learning with a posteriori simulations** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Ho, J., Talei, M., Brouzet, D., Chung, W., Sharma, P., Ihme, M.
  2024; 40 (1-4)
- **Coupling of detonation structure and upstream inhomogeneities in a rotating detonation engine** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Bonanni, M., Brouzet, D., Vignat, G., Ihme, M.
  2024; 40 (1-4)
- **Examining diesel-spray assisted ignition of ammonia under reactivity-controlled conditions using large-eddy simulations** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Sharma, P., Brouzet, D., Chung, W., Ihme, M.
  2024; 40 (1-4)
- **Predictions of instantaneous temperature fields in jet-in-hot-coflow flames using a multi-scale U-Net model** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Kildare, J. A. C., Chung, W., Evans, M. J., Tian, Z. F., Medwell, P. R., Ihme, M.
  2024; 40 (1-4)
- **Integrated experimental and computational analysis of porous media combustion by combining gas-phase synchrotron μCT, IR-imaging, and pore-resolved simulations** *COMBUSTION AND FLAME*
  Boigne, E., Zirwes, T., Parkinson, D. Y., Vignat, G., Muhunthan, P., Barnard, H. S., MacDowell, A. A., Ihme, M.
  2024; 259
- **Analysis of direct and indirect noise in a next-generation aviation gas turbine combustor** *COMBUSTION AND FLAME*
  Brouzet, D., Krisna, B., Mccormick, D., Reimann, C., Mendoza, J., Ihme, M.
  2024; 260

- **Autonomous screening of complex phase spaces using Bayesian optimization for SAXS measurements** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
  Younes, K., Poli, M., Muhunthan, P., Rajkovic, I., Ermon, S., Weiss, T. M., Ihme, M.
  2023; 1057
- **Autonomous screening of complex phase spaces using Bayesian optimization for SAXS measurements.** *Nuclear instruments & methods in physics research. Section A, Accelerators, spectrometers, detectors and associated equipment*
  Younes, K., Poli, M., Muhunthan, P., Rajkovic, I., Ermon, S., Weiss, T. M., Ihme, M.
  2023; 1057
- **Evaluation of Electron Tomography Capabilities for Shale Imaging.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Frouté, L., Boigné, E., Jolivet, I. C., Chaput, E., Creux, P., Ihme, M., Kovscek, A. R.
  2023
- **Improving volume-averaged simulations of matrix-stabilized combustion through direct X-ray μCT characterization: Application to NH₃/H₂-air combustion** *COMBUSTION AND FLAME*
  Zirwes, T., Vignat, G., Toro, E. R., Boigne, E., Younes, K., Trimis, D., Ihme, M.
  2023; 257
- **Accelerating Large-Eddy Simulations of Clouds With Tensor Processing Units** *JOURNAL OF ADVANCES IN MODELING EARTH SYSTEMS*
  Chammas, S., Wang, Q., Schneider, T., Ihme, M., Chen, Y., Anderson, J.
  2023; 15 (10)
- **Assessing requirements for modeling radiation in diffusion flames using an analytical, non-local model** *COMBUSTION AND FLAME*
  Fraga, G. C., Wu, B., Ihme, M., Zhao, X.
  2023; 255
- **Local Rearrangement in Adsorption Layers of Nanoconfined Ethane** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Simeski, F., Wu, J., Hu, S., Tsotsis, T. T., Jessen, K., Ihme, M.
  2023
- **Recurrent Convolutional Deep Neural Networks for Modeling Time-Resolved Wildfire Spread Behavior** *FIRE TECHNOLOGY*
  Burge, J., Bonanni, M. R., Hu, R., Ihme, M.
  2023
- **LES of HCCI combustion of iso-octane/air in a flat-piston rapid compression machine** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Chung, W., Ly, N., Ihme, M.
  2023; 39 (4): 5309-5317
- **Combustion of lean ammonia-hydrogen fuel blends in a porous media burner** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Vignat, G., Akoush, B., Toro, E. R., Boigne, E., Ihme, M.
  2023; 39 (4): 4195-4204
- **Interaction of preferential evaporation and low-temperature chemistry in multicomponent counterflow spray flames** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Bonanni, M., Ihme, M.
  2023; 39 (2): 2565-2573
- **Wall heat transfer and flame structure transitions in stagnating spray flames** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Mohaddes, D., Ihme, M.
  2023; 39 (2): 2683-2692
- **Jet-entrainment sampling: A new method for extracting particles from flames** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Michelsen, H. A., Boigne, E., Schrader, P. E., Johansson, K., Campbell, M. F., Bambha, R. P., Ihme, M.
  2023; 39 (1): 847-855
- **The Local Electronic Structure of Supercritical CO2 from X-ray Raman Spectroscopy and Atomistic-Scale Modeling.** *The journal of physical chemistry letters*
  Muhunthan, P., Paredes Mellone, O., Kroll, T., Sokaras, D., Ihme, M.

2023: 4955-4961

- **Reaction nanoscopy of ion emission from sub-wavelength propanediol droplets.** *Nanophotonics (Berlin, Germany)*
  Rosenberger, P., Dagar, R., Zhang, W., Majumdar, A., Neuhaus, M., Ihme, M., Bergues, B., Kling, M. F.
  2023; 12 (10): 1823-1831
- **Analysis of ducted fuel injection at high-pressure transcritical conditions using large-eddy simulations** *INTERNATIONAL JOURNAL OF ENGINE RESEARCH*
  Guo, J., Brouzet, D., Chung, W., Ihme, M.
  2023
- **Supercritical fluids behave as complex networks.** *Nature communications*
  Simeski, F., Ihme, M.
  2023; 14 (1): 1996
- **Reaction nanoscopy of ion emission from sub-wavelength propanediol droplets** *NANOPHOTONICS*
  Rosenberger, P., Dagar, R., Zhang, W., Majumdar, A., Neuhaus, M., Ihme, M., Bergues, B., Kling, M. F.
  2023
- **A Review of Physics-Informed Machine Learning in Fluid Mechanics** *ENERGIES*
  Sharma, P., Chung, W., Akoush, B., Ihme, M.
  2023; 16 (5)
- **Experimental and numerical investigation of flame stabilization and pollutant formation in matrix stabilized ammonia-hydrogen combustion** *COMBUSTION AND FLAME*
  Vignat, G., Zirwes, T., Toro, E. R., Younes, K., Boigne, E., Muhunthan, P., Simitz, L., Trimis, D., Ihme, M.
  2023; 250
- **Cost-constrained adaptive simulations of transient spray combustion in a gas turbine combustor** *COMBUSTION AND FLAME*
  Mohaddes, D., Brouzet, D., Ihme, M.
  2023; 249
- **Regimes of evaporation and mixing behaviors of nanodroplets at transcritical conditions** *FUEL*
  Ly, N., Majumdar, A., Ihme, M.
  2023; 331
- **A high-resolution large-eddy simulation framework for wildland fire predictions using TensorFlow** *INTERNATIONAL JOURNAL OF WILDLAND FIRE*
  Wang, Q., Ihme, M., Linn, R. R., Chen, Y., Yang, V., Sha, F., Clements, C., Mcdanold, J. S., Anderson, J.
  2023; 32 (12): 1711-1725
- **Turbulence in Focus: Benchmarking Scaling Behavior of 3D Volumetric Super-Resolution with BLASTNet 2.0 Data**
  Chung, W., Akoush, B., Sharma, P., Tamkin, A., Jung, K., Chen, J. H., Guo, J., Brouzet, D., Talei, M., Savard, B., Poludnenko, A. Y., Ihme, M.
  edited by Oh, A., Neumann, T., Globerson, A., Saenko, K., Hardt, M., Levine, S.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2023
- **Dynamics and structure of detonations in stratified product-gas diluted mixtures** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Brouzet, D., Vignat, G., Ihme, M.
  2023; 39 (3): 2855-2864
- **Analysis of real-fluid thermodynamic effects on turbulent statistics in transcritical channel flows** *Physical Review Fluids*
  Li, F., Guo, J., Bai, B., Ihme, M.
  2023; 8 (2): 024605
- **Corrosive Influence of Carbon Dioxide on Crack Initiation in Quartz: Comparison With Liquid Water and Vacuum Environments** *Journal of Geophysical Research: Solid Earth*
  Simeski, F., Ihme, M.
  2023; 128 (1)
- **The dynamics of non-premixed flames subjected to a transverse acoustic mode** *COMBUSTION AND FLAME*
  Brouzet, D., You, S., Plascencia, M. A., Roa, M., Ihme, M.

2022; 246

- **BLASTNet: A call for community-involved big data in combustion machine learning** *APPLICATIONS IN ENERGY AND COMBUSTION SCIENCE*
  Chung, W., Jung, K., Chen, J. H., Ihme, M.
  2022; 12
- **Computing Thermodynamic Properties of Fluids Augmented by Nanoconfinement: Application to Pressurized Methane.** *The journal of physical chemistry. B*
  Singh, N., Simeski, F., Ihme, M.
  2022
- **Simulations of Dusty Flows over Full-Scale Capsule During Martian Entry** *JOURNAL OF SPACECRAFT AND ROCKETS*
  Ching, E. J., Singh, N., Ihme, M.
  2022
- **Turbulence-induced bias in time-averaged laser absorption tomography of correlated concentration and temperature fields with a first-order correction** *COMBUSTION AND FLAME*
  Wei, C., Perakis, N., Pineda, D., Egolfopoulos, F. N., Ihme, M., Spearrin, R.
  2022; 242
- **Destabilization of binary mixing layer in supercritical conditions** *JOURNAL OF FLUID MECHANICS*
  Ly, N., Ihme, M.
  2022; 945
- ** Combustion machine learning: Principles, progress and prospects ** *PROGRESS IN ENERGY AND COMBUSTION SCIENCE*
  Ihme, M., Chung, W., Mishra, A.
  2022; 91
- **On the hot surface ignition of a wall-stagnating spray flame** *COMBUSTION AND FLAME*
  Mohaddes, D., Ihme, M.
  2022; 240
- **Interpretable data-driven methods for subgrid-scale closure in LES for transcritical LOX/GCH4 combustion** *COMBUSTION AND FLAME*
  Chung, W., Mishra, A., Ihme, M.
  2022; 239
- **ATensorFlow simulation framework for scientific computing of fluid flows on tensor processing units** *COMPUTER PHYSICS COMMUNICATIONS*
  Wang, Q., Ihme, M., Chen, Y., Anderson, J.
  2022; 274
- **Computation of hypersonic viscous flows with the thermally perfect gas model using a discontinuous Galerkin method** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN FLUIDS*
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