

## ZHANG, Peng (張鵬)

Associate Professor

Department of Mechanical Engineering

City University of Hong Kong

Kowloon Tong, Kowloon, Hong Kong

Tel: (852)3442-9561

Email: [penzhang@cityu.edu.hk](mailto:penzhang@cityu.edu.hk)

Official webpage: <https://www.cityu.edu.hk/mne/people/academic-staff/dr-zhang-peng>

Personal webpage: <https://www.rgcombustion.org/leader>

ORCID ID: 0000-0002-1806-4200

Scopus ID: 55547102789

### Education

- |      |  |
|------|--|
| 2010 | Ph.D. in Mechanical and Aerospace Engineering<br>Princeton University                |
| 2003 | M.S. in Aerospace Engineering<br>Institute of Mechanics, Chinese Academy of Sciences |
| 2000 | B.S. in Mechanical Engineering<br>University of Science and Technology of China      |

### Employment

- |              |  |
|--------------|--|
| 2022-Present | Associate Professor<br>Department of Mechanical Engineering<br>City University of Hong Kong  |
| 2012-2022    | Associate Head (2021-2022)<br>Associate Professor (2017-2022), Assistant Professor (2012-2017)<br>Department of Mechanical Engineering<br>The Hong Kong Polytechnic University |
| 2010-2012    | Combustion Energy Research Fellow<br>Combustion Energy Frontier Research Center of U.S. Department of Energy<br>Princeton University   |
| 2010         | Postdoctoral Research Associate<br>Department of Mechanical and Aerospace Engineering<br>Princeton University  |

2003-2004      Research Staff  
                    Institute of Mechanics, Chinese Academy of Sciences

### **Research Interests**

Droplet and spray dynamics; Theoretical chemical kinetics; Supersonic combustion; Fire whirl;  
Gas-turbine combustion; Rarefied gas dynamics

### **Honors and Awards**

2017      Guest Professor  
                    State Key Laboratory of High-temperature Gas Dynamics, Chinese Academy of Sciences

2016      Research Grant Achievement Award  
                    Faculty of Engineering, The Hong Kong Polytechnic University

2014      The Appreciation of Research Achievement  
                    Committee of Science and Technology of Innovation of Shenzhen

2010      Combustion Energy Research Fellowship  
                    Princeton University

2008      Wu Prize for Excellence  
                    Princeton University

2004      Yongling Liu Fellowship  
                    Chinese Academy of Sciences

2002      Yung-Huai Kuo Fellowship  
                    Institute of Mechanics, Chinese Academy of Sciences

2000      Best Senior Thesis Prize  
                    University of Science and Technology of China

### **Teaching**

|         |  |                                      |
|---------|--|--------------------------------------|
| MNE3010 | Mechanical Design                        | (2022-2023, Spring Semester)         |
| AP10005 | Physics I                                | (2013-2014, Fall Semester)           |
| ME3403  | Advanced Engineering Science in Products | (2012-2015, Fall & Spring Semesters) |
| ME3407  | Fluid Mechanics                          | (2012-2014, Fall & Spring Semesters) |
| ME34003 | Thermofluid Mechanics                    | (2018-2019, Spring Semester)         |
| ME34004 | Fluid Mechanics                          | (2014-2015, Spring Semester)         |

|         |   |                                      |
|---------|---|--------------------------------------|
| ME4409  | Engine Technology                       | (2013-2015, Fall & Spring Semesters) |
| ME44003 | Combustion and Pollution Control        | (2017-2018, Spring Semester)         |
| ME47007 | Aircraft and Spacecraft Propulsion      | (2018-2019, Fall Semester)           |
| ME556   | Advanced Combustion Systems             | (2014-2022, Fall & Spring Semester)  |
| ME576   | Turbulent Flow and Aerodynamics         | (2014-2021, Spring Semester)         |
| ME6401  | Combustion Science                      | (2014-2022, Fall Semester)           |
| ME6603  | Advanced Math. of Phys. and Modern Eng. | (2019-2022, Spring Semester)         |

### **Other Teaching Activities**

|   |  |
|---|--|
| Theoretical Chemical Kinetics of Unimolecular Reactions | (2015, Invited Summer Short Course, 1 credit, 16 Hours, Tsinghua University) |
| Combustion Science and Engineering                      | (2017, Invited Summer Full Course, 3 credits, 45 Hours, Peking University)   |

### **Professional Society Membership**

Member of Combustion Institute  
Senior member AIAA  
Member of American Physics Society  
Member of Chinese Chemistry Society

### **Academic Services**

#### **Conference Session Chair**

1. International Conference on Liquid Atomization and Spray Systems, Edinburgh, Scotland, 2021,
2. The 38<sup>th</sup> International Symposium on Combustion, Adelaide, Australia, 2021
3. The 21<sup>st</sup> Annual Conference on Liquid Atomization and Spray Systems – Asia, Zhenjiang, 2020
4. The 12<sup>th</sup> Asia-Pacific Conference on Combustion, Fukuoka, 2019
5. 2018, 2019, 2020 China National Symposium on Combustion
6. The 13<sup>th</sup> International Conference on Combustion & Energy Utilization, Taipei, 2016
7. The 10<sup>th</sup> Asia-Pacific Conference on Combustion, Beijing, 2015
8. The 4<sup>th</sup> and 8<sup>th</sup> East Asia Mechanical and Aerospace Engineering Workshop, the Hong Kong Polytechnic University, 2014, 2018.

9. Fall Technical Meeting Eastern States Section of the Combustion Institute, University of Connecticut, 2011

### **Reviewer**

- Journals in Science: Proceedings of the National Academy of Sciences (PNAS)
- Journals in Physics: Journal of Fluid Mechanics, Physics of Fluids, Scientific Reports, Journal of Colloid and Interface Science, SCIENTIA SINICA
- Journals in Chemistry: Journal of American Chemical Society, Journal of Physical Chemistry A, Langmuir, International Journal of Chemical Kinetics, ACS Omega, AIChE Journal, Analytical Chemistry, Chemical Engineering Journal, Colloids and Surfaces A, Thermochimica Acta
- Journals in Mechanical Engineering: Combustion and Flame, Proceedings of Combustion Institute, Combustion Science and Technology, International Journal of Heat and Mass Transfer, International Journal of Multiphase Flow, Atomization and Sprays, Fire Technology, International Journal of Hydrogen Energy, Energy Conversion and Management, European Journal of Mechanics -B/Fluids, Energy Reports, Energy and Fuel, Fuel, Journal of Thermal Analysis and Calorimetry, Advances in Mechanical Engineering
- Journals in Aerospace Engineering: AIAA Journal, Journal of Propulsion and Power, Journal of Aerospace Engineering, Shock Waves, Aerospace Science and Technology, Advances in Aerodynamics, Chinese Journal of Aeronautics
- Conferences: AIAA, ASME, ASPACC, ICLASS, ISAAC-NL, Chinese National Combustion Meeting
- Funding Agencies: Research Council of Norway, U.S. Department of Energy, The Israel Science Foundation

### **Funded Research Projects (in the capacity of Principal Investigator)**

#### **By Hong Kong Research Grants Council (HKRGC)**

1. General Research Fund (GRF), Jan. 2022 – Dec. 2024, HKD 816.601K  
*A Theoretical, Experimental, and Computational Framework for Droplet Collision Modelling in Lagrangian-Eulerian Simulation of Sprays*
2. General Research Fund (GRF), Jan. 2021 – Dec. 2023, HKD 873.995K  
*Towards Quantitatively Predictive Modelling of Droplet Collision in Spray Simulation: Head-on Collision of Equal-size Droplets*
3. General Research Fund (GRF), Jan. 2017 – Dec. 2019, HKD 675.647K

*Experimental and Numerical Investigation on the Collision of Binary Droplets of Shear-thinning Fluids in Atmospheric Air*

4. General Research Fund (GRF), Jan. 2015 – Dec. 2017, HKD 500K  
*Dynamics of Binary Droplet Collision under Elevated Pressures*
5. Early Career Scheme (ECS), Jan. 2014 – Dec. 2016, HKD 789K  
*Ab initio Chemical Kinetics for Key Reactions in Biodiesel Combustion*
6. SRFDP&RGC ERG Joint Research Scheme, Jan. 2014 – Dec. 2016, HKD 400K  
*Theoretical Chemical Kinetics for Pyrolysis and Oxidation of Large Biodiesel Molecules*

#### **By National Science Foundation of China (NSFC)**

1. NSFC, General Program, 2022-2025, RMB 580K  
*Theoretical and Modelling Study on Droplet Collision in Lagrangian-Eulerian Simulation of Sprays*
2. NSFC-Major Research Plan on Turbulent Combustion, General Program, 2017-2019, RMB 600K  
*High-level Ab Initio Chemical Kinetics of Combustion of Large Molecule Straight-Chain Alkanes*

#### **By Other External Funding Agencies**

1. State Key Laboratory of Engines, Tianjin University, 2018 – 2019, RMB 100K  
*Modelling Droplet Collisions in High-pressure Sprays*
2. State Key Laboratory of High-temperature Gas Dynamics, Chinese Academy of Sciences, 2017 – 2018, RMB 200K  
*Detailed Chemical Reaction Mechanism of CO-C3 Mixtures for Supersonic Combustion*
3. Committee of Science and Technology of Innovation of Shenzhen, 2013 – 2014, RMB 340K  
*First-Principle Calculation for Chemical Kinetics of Biodiesel Combustion*

#### **By City University of Hong Kong**

1. APRC - CityU New Research Initiatives/Infrastructure Support from Central, 2022-2025  
*Fundamental Combustion and Propulsion Laboratory*

#### **By the Hong Kong Polytechnic University**

1. Postdoc Matching Fund Scheme, 2022-2024, HKD 366.912K  
*Airborne Transmission by Respiratory Droplets*
2. Postdoc Matching Fund Scheme, 2021-2023, HKD 360.360K  
*Dynamic Wetting of Newtonian and Non-Newtonian Fluids on Complex Structure Surfaces*

3. Central Research Grants, 2020 – 2022, HKD 148.780K  
*Unified Theory and Predictive Modelling for Droplet Coalescence*
4. Matching Grant for China Projects, 2017 – 2019, HKD 142.284K  
*High-level Ab Initio Chemical Kinetics of Combustion of Large Molecule Straight-chain Alkanes*
5. Joint Supervision Scheme with the Chinese Mainland, Taiwan, and Macao Universities 2018/19, 2019-2020, HKD180K  
*Spray Impingement Modelling and Simulation based on Accurate Description of Droplet Impact Dynamics*
6. Central Research Grants, 2017 – 2019, HKD 158K  
*Hypergolic Ignition Induced by Propellant Droplet Collision*
7. Central Research Grants, 2015 – 2018, HKD 189K  
*Experimental Study and Large Eddy Simulation of Slotted Swirler Combustor Fueled with Natural Gas/Synthesis Gas Mixtures*
8. Areas of Excellence Committee, 2015 – 2016, HKD 3,945,468.35 (Project Coordinator)  
*Advanced Multi-Parameter Optical/Laser Diagnostic System for Thermal-fluids*
9. Central Research Grants, 2014 – 2018, HKD 200K  
*Computational Study on Slotted Swirl Combustor for Application in Gas Turbine Engines*
10. Central Research Grants, 2013 – 2016, HKD 100K  
*Hypergolic Ignition Mechanism of a Novel "Green" Propellant for Aerospace Propulsion: A Density Functional Theory Study of DMAZ/HNO<sub>3</sub> System*
11. Central Research Grants, 2012 – 2016, HKD 450K  
*Dynamics of Unequal-size Droplet Collision*

### **Funded Research Projects (in the capacity of co-Principal Investigator)**

1. Hong Kong RGC CRF, 2015 – 2018, HKD 4,500K  
*A Unique Multipurpose Transonic-to-Hypersonic Ludwig Tube Facility for Study of the High-Speed Aerodynamics*
2. Central Research Grant, 2015-2017, HKD 189K  
*Thermal, Explosion, Burning and Emission Characteristics of Premixed Flame Jets Array Burning Liquefied Petroleum Gas Enriched with Hydrogen*
3. Central Research Grant, 2014-2016, HKD 150K  
*Thermal, Explosion, Burning and Emission Characteristics of an Array of Premixed Flame Jets Burning Liquefied Petroleum Gas Enriched with Hydrogen*

4. Central Research Grant, 2014-2016, HKD 155K  
*Biomimetic Study on the Reaction Chambers of Bombardier Beetles for Aeronautical Applications: Thermal Resistance and Pulsed Jet Propulsion*
5. NSFC-General Program, 2014 – 2017, RMB 900K  
*Fragmentation, vaporization and combustion of liquid fuels in high-speed flows*

## Journal Publications (under Review or to be submitted; Corresponding Author \*)

1. Y. Chi, Q. Meng, L. Zhang, and **P. Zhang\***, *An ONIOM-based Thermochemistry Study of Hydrogen Abstraction Reactions of  $n\text{-C}_n\text{H}_{2n+2} + \text{R}$  ( $n=1-16$ ,  $\text{R}=\text{H}$ ,  $\text{OH}$ ,  $\text{HO}_2$ )*, Journal of Physical Chemistry A (to be submitted)
2. Q. Meng, Y. Chi, L. Zhang, and **P. Zhang\***, Barrierless reaction investigated with Vibrational Transition State Theory/ Master equations accounts for the undefined products of benzyl decomposition, Physical Chemistry Chemical Physics (under review)
3. D. Zhang\*, D. Yu\*, **P. Zhang**, Y. Yuen, and X. Fan, Structural Characteristics in Hypergolic Ignition Induced by Binary Collision of Bipropellant Droplets of Monoethanolamine-based Fuel and Hydrogen Peroxide, Fuel (under review)
4. T. Yang and **P. Zhang\***, *Faster Flicker of Buoyant Diffusion Flames by Weakly Rotatory Flows*, Combust. Flame (under review)
5. Y. Chi, T. Yang and **P. Zhang\***, *Dynamical Mode Recognition of Triple Flickering Buoyant Diffusion Flames in Wasserstein Space*, Combust. Flame (under review)

## Journal Publications (Published or in Press; Corresponding Author \*)

### 2023

1. T. Yang, Y. Chi, and **P. Zhang\***, *Vortex Interaction in Triple Flickering Buoyant Diffusion Flames*, Proceedings of the Combustion Institute (in press)
2. Y. Yang, H. Zhang, X. Xia\*, **P. Zhang**, and F. Qi, *An experimental study of the blue whirl onset*, Proceedings of the Combustion Institute (in press)

### 2022

3. C. Liu, J. Yu, C. Tang\*, **P. Zhang**, and Z. Huang, *Experimental and theoretical investigation on the liquid film behaviors by an inclined jet-wall impingement*, Phys. Fluids (in press)
4. Y. Chi, Q. Meng, C. He and **P. Zhang\***, *A Metric-based Assessment Method for Subsets of Torsional Conformers used in MS-T Formalism*, J. Phys. Chem. A (in press)
5. H. Fu, Z. Huang, C. Tang\*, and **P. Zhang**, *Effect of mixer structure on liquid film formation and NO<sub>x</sub> conversion efficiency in Selective Catalytic Reduction system*, Fuel 330 (2022) 125405.
6. K. Wu, **P. Zhang** and X. Fan\*, *A Hybrid LES/RANS Study on Jet-wave Flame Stabilization in Scramjet: A New Interpretation Based on Counter-rotating Vortex Pair*, Aerospace Science and Technology, 120 (2022) 107255.



7. J. Bai, H. Zhao\*, C. Zhou and **P. Zhang**, *Theoretical Studies of Real-Fluid Oxidation of Hydrogen Under Supercritical Conditions by Using the Virial Equation of State*, Combustion and Flame 243 (2022) 111945.
8. C. He, L. Yue, and **P. Zhang\***, Spin-affected reflexive and stretching separation of off-center droplet collision, Physical Review Fluids 7, 013603 (2022).
9. M. Qin, T. Yang, Y. Song, C. Tang\* and **P. Zhang**, Subpatterns of thin-sheet splash of a droplet impact on a heated surface, Langmuir 2022, 38, 810-817.

## 2021

10. T. Huang, Q. Zhang, L. Yue\*, **P. Zhang**, and X. Chang, *Hysteresis of shock train movement in a Mach 3 isolator with a ramp*, AIAA Journal Vol. 59, No. 10, 3873-3882, October 2021.
11. C. He, Y. Chi and **P. Zhang\***, *Approximate Reconstruction of Torsional Potential Energy Surface based on Voronoi Tessellation*, Proceedings of the Combustion Institute, 38 (2021) 757-766.
12. M. Yang, C. Liao, C. Tang\*, **P. Zhang**, and Z. Huang, *Theoretical studies on the initial reaction kinetics and mechanisms of p-, m- and o-nitrotoluene*, Physical Chemistry Chemical Physics, 2021, 23, 4658.
13. K. Sun\*, F. Jia, **P. Zhang**, L. Shu and T. Wang, *Marangoni effect in bi-propellant droplet mixing*, Physical Review Applied, 15, 034076 (2021).
14. M. Yang, C. Liao, C. Tang\*, **P. Zhang**, and Z. Huang, *The auto-ignition behaviors and risk assessments of double-base propellant containing different 1,1-diamino-2,2-dinitroethene particle sizes under rapid heating*, Combustion and Flame 234 (2021) 111627.
15. C. He, L. Yue, and **P. Zhang\***, *A Computational Model for Spinning Effects on Post-collision Velocities of Bouncing Droplets*, Atomization and Sprays, 31(10):43-61 (2021).
16. L. Yang, Z. Li, T. Yang, Y. Chi and **P. Zhang\***, *Experimental Study on Droplet Splash and Receding Breakup on a Smooth Surface at Atmospheric Pressure*, Langmuir 2021, 37, 10838-10848.

## 2020

17. C. He and **P. Zhang\***, *Non-axisymmetric flow characteristics in head-on collision of spinning droplets*, Physical Review Fluids, 5, 113601, (2020).
18. Q. Meng, L. Zhang, Y. Chi, Q. Chen, and **P. Zhang\***, *Influence of Torsional Anharmonicity on the Reactions of Methyl Butanoate with Hydroperoxyl Radical*, Journal of Physical Chemistry A, 2020, 124, 8643-8652.
19. F. Jia, K. Sun\*, **P. Zhang**, C. Yin, and T. Wang, *Marangoni effect on the impact of droplets onto a liquid-gas interface*, Physical Review Fluids, 5, 073605, (2020).

20. T. Huang, L. Yue\*, S. Ma, Q. Zhang, **P. Zhang**, and X. Chang, *Numerical investigation on flow nonuniformity-induced hysteresis in the scramjet isolator*, Chinese Journal of Aeronautics, (2020), 33(12): 3176-3188.
21. X. Zhu, X. Xia and **P. Zhang\***, *Stability of Buoyant Inverse Diffusion Methane Flames with Confinement Effects*, Combustion Science and Technology, 2020, Vol. 192, No. 9, 1650-1667.
22. M. Qin, C. Tang\*, Y. Guo, **P. Zhang**, and Z. Huang, *Spreading and Bouncing of Liquid Alkane Droplets upon Impacting on a Heated Surface*, International Journal of Heat and Mass Transfer, 159 (2020), 120076.
23. Q. Meng, B. Feng, L. Zhang\*, **P. Zhang\*** and L. Sheng, *Theoretical Chemical Kinetics for Catalytic Pyrolysis of Methyl Acetate over H-ZSM-5 Zeolites*, Fuel, 277 (2020), 118101.
24. M. Qin, C. Tang\*, Y. Guo, **P. Zhang**, and Z. Huang, *Sub-patterns of thin sheet splash on a smooth surface*, Langmuir, 2020, 36(18), 4917-4922.
25. C. He, X. Xia, **P. Zhang\***, *Vortex-Dynamical Implications of Nonmonotonic Viscous Dissipation of Off-center Droplet Bouncing*, Physics of Fluids 32, 032004 (2020).
26. Q. Meng, X. Lin, Y. Zhai, L. Zhang\*, **P. Zhang\*** and L. Sheng, *A theoretical investigation on Bell-Evans-Polanyi correlations for hydrogen abstraction reactions of large biodiesel molecules by H and OH radicals*, Combustion and Flame, 214, (2020) 396-406.

## 2019

27. Z. Feng, C. Tang\*, Y. Yin, **P. Zhang\*** and Z. Huang, *Time-resolved droplet size and velocity distributions in a dilute regions of a high-pressure pulsed diesel spray*, International Journal of Heat and Mass Transfer 133 (2019) 745-755.
28. J. Wu, H. Ning, L. Ma, **P. Zhang** and W. Ren\*, *Cascaded group-additivity ONIOM: a new method to approach CCSD(T)/CBS energies of large aliphatic hydrocarbons*, Combustion and Flame 201 (2019) 31-43.
29. Y. Li\*, **P. Zhang\***, N. Kang and F. Liu, *Rayleigh-Taylor instability on a spherical droplet with nonradial disturbances*, Applied Mathematical Modelling 67 (2019) 634-644.
30. K. Wu, **P. Zhang\***, W. Yao\* and X. Fan, *Computational realization of multiple flame stabilization modes in DLR strut-injection hydrogen supersonic combustor*, Proceedings of the Combustion Institute 37 (2019) 3685-3692.
31. Q. Meng, Y. Chi, L. Zhang\*, **P. Zhang\*** and L. Sheng, *A theoretical kinetics study on isomerization and dissociation reactions of methyl decanoate radicals*, Physical Chemistry Chemical Physics 21 (2019), 5232-5242.

32. Y. Wu, M. Yang, C. Tang\*, Y. Liu, **P. Zhang**, Z. Huang, *Promoting “adiabatic core” approximation in a rapid compression machine by an optimized creviced piston design*, Fuel 251 (2019) 328-340.
33. T. Yang, X. Xia, and **P. Zhang\***, *Anti-phase and In-phase Flickering of Dual Pool Flames*, Physical Review Fluids 4, 053202 (2019).
34. C. He, X. Xia, and **P. Zhang\***, *Non-monotonic Viscous Dissipation of Bouncing Droplets undergoing Off-center Collision*, Physics of Fluids 31, 052004 (2019).
35. M. Qin, C. Tang\*, S. Tong, Y. Guo, X. Weng, **P. Zhang\*** and Z. Huang, *On the role of liquid viscosity in affecting droplet spreading on a smooth solid surface*, International Journal of Multiphase Flow 117 (2019) 53-63.
36. D. Zhang, D. Yu, **P. Zhang\***, Y. Yuan, L. Yue, T. Zhang and X. Fan, *Hypergolic Ignition Modulated by Head-on Collision, Intermixing and Convective Cooling of Binary Droplets with Varying Sizes*, International Journal of Heat and Mass Transfer 139 (2019) 475-481.
37. X. Xia, C. He and **P. Zhang\***, *Universality in the viscous-to-inertial coalescence of liquid droplets*, Proceedings of the National Academy of Sciences (PNAS), 2019 116 (47) 23467-23472.
38. Z. Zhang and **P. Zhang\***, *Numerical interpretation to the roles of liquid viscosity in droplet spreading at small Weber numbers*, Langmuir 2019, 35, 16164-16171.

## 2018

39. Y. Li\*, **P. Zhang\*** and N. Kang, *Linear Faraday instability on a viscous droplet immersed in another inviscid fluid*, Physics of Fluids 30, 102104 (2018).
40. Z. Zhang and **P. Zhang\***, *Cross-Impingement and Combustion of Sprays in High-Pressure Chamber and Opposed-piston Compression Ignition Engine*, Applied Thermal Engineering 144 (2018) 137-146.
41. Z. Zhang and **P. Zhang\***, *Modelling kinetic energy dissipation of bouncing droplets for Lagrangian simulation of impinging sprays under high ambient pressures*, Atomization and Sprays, 28(8): 637-694 (2018).
42. X. Xia and **P. Zhang\***, *A vortex-dynamical scaling theory for flickering buoyant diffusion flames*, Journal of Fluid Mechanics (2018), vol. 855, pp.1156-1169.
43. L. Zhang, Q. Meng, Y. Chi and **P. Zhang\***, *Toward High-Level Theoretical Studies of Large Biodiesel Molecules: An ONIOM [QCISD(T)/CBS:DFT] Study of the Reactions between Unsaturated Methyl Esters ( $C_nH_{2n-1}COOCH_3$ ) and Hydrogen Radical*. Journal of Physical Chemistry A, 122 (2018) 4882-4893.

44. D. Zhang, C. He, **P. Zhang\*** and C. Tang, *Mass Interminglement and Hypergolic Ignition of TMEDA and WFNA Droplets by Off-center Collision*, Combustion and Flame 197 (2018) 276-289.
45. Q. Meng, X. Zhao, L. Zhang\*, **P. Zhang\***, and L. Sheng, *A theoretical kinetics study on low-temperature reactions of methyl acetate radicals with molecular oxygen*. Combustion and Flame, 196 (2018) 66-75.
46. X. Zhu, X. Xia, and **P. Zhang\***, *Near-field Flow Stability of Buoyant Methane/Air Inverse Diffusion Flames*. Combustion and Flame, 191 (2018) 66-75.
47. D. Yu and **P. Zhang\***, *Circulation-controlled firewhirl with differential diffusion*. Combustion and Flame, 189 (2018) 288–299.
48. L.Y. Yue\*, Y. Jia, X. Xu, X. Zhang, and **P. Zhang**, *Effects of Cowl Shock on the Self-starting Characteristics of Hypersonic Inlets*. Aerospace Science and Technology, 74 (2018) 72-80.
49. K. Sun\*, **P. Zhang**, Z. Che, and T. Wang, *Marangoni-flow-induced partial coalescence of a droplet on a liquid/air interface*. Physical Review Fluids 3, 023602 (2018).
50. K. Sun, **P. Zhang\***, M. Jia, and T. Wang, *Collision-induced jet-like mixing for droplets of unequal-sizes*. International Journal of Heat and Mass Transfer, 120 (2018) 218-227.

## 2017

51. X. Xia, C. He, J. Zhao, D. Yu, and **P. Zhang\***, *Vortex-Ring-Induced Internal Mixing Upon the Coalescence of Initially Stationary Droplets*. Physical Review Fluids, 2, 113607 (2017).
52. Z. Zhang and **P. Zhang\***, *Kinetic Energy Recovery and Interface Hysteresis of Bouncing Droplets after Inelastic Head-on Collision*, Physics of Fluids, 29, 103306 (2017).
53. K. Wu, **P. Zhang\***, W. Yao, and X. Fan, *Numerical Investigation on Flame Stabilization in DLR Hydrogen Supersonic Combustor with Strut Injection*. Combustion Science and Technology, 2017. 189(12): p. 2154-2179.
54. Z. Zhang, **P. Zhang\***, and Z. Zhao, *Impingement and Combustion of Sprays in a Model Opposed-Piston Compression Ignition Engine*. Combustion Science and Technology, 2017. 189(11): p.1943-1965.
55. C. Tang\*, X. Zhang, L. Song, M. Qin, **P. Zhang**, J. Li and Z. Huang, *Dynamics of droplet impact on solid surface with different roughness*. International Journal of Multiphase Flows, 96: p. 56–69.
56. D. Yu and **P. Zhang\***, *On the flame height of circulation-controlled firewhirl with variable density and in power-law vortices: a mass-diffusivity-ratio model correction*. Combustion and Flame, 2017. 182: p. 36–47.

57. D. Yu and **P. Zhang\***, *On the flame height of circulation-controlled firewhirls with variable density*. Proceedings of the Combustion Institute, 2017. 36(2): p. 3097-3104.
58. Y. Yuan, T. Zhang, W. Yao, X. Fan\*, and **P. Zhang**, *Characterization of flame stabilization modes in an ethylene-fueled supersonic combustor using time-resolved CH\* chemiluminescence*. Proceedings of the Combustion Institute, 2017. 36(2): p. 2919-2925.
59. L. Shi, H. Shen, **P. Zhang**, D. Zhang, and C. Wen\*, *Assessment of vibrational non-equilibrium effect on detonation cell size*. Combustion Science and Technology, 2017. 189(5): p. 841-853.

## 2016

60. C.L. Tang, J.Q. Zhao, **P. Zhang\***, C.K. Law\*, and Z.H. Huang, *Dynamics of internal jets in the merging of two droplets of unequal sizes*. Journal of Fluid Mechanics, 2016. 795: p. 671-689.
61. Z. Zhang, Y. Chi, L. Shang, **P. Zhang\***, and Z. Zhao, *On the role of droplet bouncing in modeling impinging sprays under elevated pressures*. International Journal of Heat and Mass Transfer, 2016. 102: p. 657-668.
62. D. Zhang, **P. Zhang\***, Y. Yuan, and T. Zhang, *Hypergolic Ignition by Head-on Collision of N,N,N',N'-tetramethylethylenediamine and White Fuming Nitric Acid Droplets*. Combustion and Flame, 2016. 173: p. 276-287.

## 2015

63. K. Sun, **P. Zhang\***, C.K. Law\*, and T.Y. Wang, *Collision Dynamics and Internal Mixing of Droplets of Non-Newtonian Liquids*. Physical Review Applied, 2015. 4(5).
64. K. Sun, T.Y. Wang, **P. Zhang\***, and C.K. Law, *Non-Newtonian flow effects on the coalescence and mixing of initially stationary droplets of shear-thinning fluids*. Physical Review E, 2015. 91(2).
65. **P. Zhang\***, L.D. Zhang, and C.K. Law, *Density functional theory study of the reactions of 2-azido-N,N-dimethylethanamine with nitric acid and nitrogen dioxide*. Combustion and Flame, 2015. 162(1): p. 237-248.
66. X.R. Zhu, R.F. Li\*, D.G. Li\*, **P. Zhang\***, and R.Z. Qian, *Experimental study and RANS calculation on velocity and temperature of a kerosene-fueled swirl laboratory combustor with and without centerbody air injection*. International Journal of Heat and Mass Transfer, 2015. 89: p. 964-976.
67. Y.C. Li, R.F. Li\*, D.G. Li\*, J.Y. Bao, and **P. Zhang\***, *Combustion characteristics of a slotted swirl combustor: An experimental test and numerical validation*. International Communications in Heat and Mass Transfer, 2015. 66: p. 140-147.

68. L.D. Zhang and **P. Zhang\***, *Towards high-level theoretical studies of large biodiesel molecules: an ONIOM [QCISD(T)/CBS:DFT] study of hydrogen abstraction reactions of  $C_nH_{2n+1}COOC_mH_{2m+1} + H$* . Physical Chemistry Chemical Physics, 2015. 17(1): p. 200-208.
69. L.D. Zhang, Q.X. Chen, and **P. Zhang\***, *A theoretical kinetics study of the reactions of methylbutanoate with hydrogen and hydroxyl radicals*. Proceedings of the Combustion Institute, 2015. 35: p. 481-489.

## 2014

70. **P. Zhang\***, S.J. Klippenstein\*, L.B. Harding, H.Y. Sun, and C.K. Law, *Secondary channels in the thermal decomposition of monomethylhydrazine ( $CH_3NHNH_2$ )*. RSC Advances, 2014. 4(108): p. 62951-62964.
71. T.C. Zhang, J. Wang, X.J. Fan\*, and **P. Zhang**, *Combustion of Vaporized Kerosene in Supersonic Model Combustors with Dislocated Dual Cavities*. Journal of Propulsion and Power, 2014. 30(5): p. 1152-1160.
72. T.C. Zhang, J. Wang, L. Qi, X. Fan\*, and **P. Zhang**, *Blowout Limits of Cavity-Stabilized Flame of Supercritical Kerosene in Supersonic Combustors*. Journal of Propulsion and Power, 2014. 30(5): p. 1161-1166.

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73. **P. Zhang**, S.J. Klippenstein\*, and C.K. Law, *Ab Initio Kinetics for the Decomposition of Hydroxybutyl and Butoxy Radicals of n-Butanol*. Journal of Physical Chemistry A, 2013. 117(9): p. 1890-1906.
74. D. Liu, **P. Zhang\***, C.K. Law, and Y.C. Guo, *Collision dynamics and mixing of unequal-size droplets*. International Journal of Heat and Mass Transfer, 2013. 57(1): p. 421-428.

## Before 2013

75. H.Y. Sun, **P. Zhang**, and C.K. Law\*, *Ab Initio Kinetics for Thermal Decomposition of  $CH_3N\cdot NH_2$ , cis- $CH_3NHN\cdot H$ , trans- $CH_3NHN\cdot H$ , and  $C\cdot H_2NNH_2$  Radicals*. Journal of Physical Chemistry A, 2012. 116(33): p. 8419-8430.
76. H.Y. Sun, **P. Zhang**, and C.K. Law\*, *Gas-Phase Kinetics Study of Reaction of OH Radical with  $CH_3NHNH_2$  by Second-Order Multireference Perturbation Theory*. Journal of Physical Chemistry A, 2012. 116(21): p. 5045-5056.
77. S.W. Yoo, S. Chaudhuri, K.R. Sacksteder, **P. Zhang**, D.L. Zhu, and C.K. Law\*, *Response of spherical diffusion flames subjected to rotation: Microgravity experimentation and computational simulation*. Combustion and Flame, 2012. 159(2): p. 665-672.

78. C. Tang, **P. Zhang**, and C.K. Law\*, *Bouncing, coalescence, and separation in head-on collision of unequal-size droplets*. Physics of Fluids, 2012. 24(2).
79. **P. Zhang** and C.K. Law\*, *An analysis of head-on droplet collision with large deformation in gaseous medium*. Physics of Fluids, 2011. 23(4).
80. **P. Zhang** and C.K. Law\*, *A Fitting Formula for the Falloff Curves of Unimolecular Reactions, II: Tunneling Effects*. International Journal of Chemical Kinetics, 2011. 43(1): p. 31-42.
81. **P. Zhang**, S.J. Klippenstein, H.Y. Sun, and C.K. Law\*, *Ab initio kinetics for the decomposition of monomethylhydrazine (CH<sub>3</sub>NHNH<sub>2</sub>)*. Proceedings of the Combustion Institute, 2011. 33: p. 425-432.
82. **P. Zhang** and C.K. Law\*, *Rarefied flow effects on stabilization and extinction of rotating-disk flame at low pressures*. International Journal of Heat and Mass Transfer, 2010. 53(1-3): p. 475-481.
83. T.C. Zhang, **P. Zhang**, C.K. Law\*, and F. Qi, *CVD in Weakly Rarefied Rotating Disk Flows*. Chemical Vapor Deposition, 2009. 15(10-12): p. 274-280.
84. **P. Zhang** and C.K. Law\*, *A Fitting Formula for the Falloff Curves of Unimolecular Reactions*. International Journal of Chemical Kinetics, 2009. 41(11): p. 727-734.
85. **P. Zhang** and C.K. Law\*, *Role of the Knudsen layer in determining surface reaction rates based on sticking coefficients*. Journal of Fluid Mechanics, 2009. 634: p. 113-135.

#### **Journal Publications (in Chinese, Corresponding Author \*)**

86. Q. Wu, Y. Li\*, N. Kang, and **P. Zhang**, *Secondary Breakup Analysis of Spherical Oil Droplets Under Time-Dependent Inertial Force*, Neiranji Xuebao/Transactions of CSICE, 2019, 37(6).
87. Y. Chi and **P. Zhang\***, *High-level Theoretical Thermochemistry Study Review on Large Gaseous Fuel Molecules*. Physics of Gases, 2019, 4(5):32-42. **(invited review paper)**.
88. C. He and **P. Zhang\***, *Binary Droplet Collision in Gaseous Environment*. SCIENCE CHINA Physics, Mechanics & Astronomy, 2017. 47(7): 070013. **(invited review paper)**.
89. **P. Zhang\*** and G. Yu, *Rayleigh-Taylor instability of a liquid drop at high Bond numbers*. Chinese Journal of Theoretical and Applied Mechanics, 2006. 38(3): p. 1-7.
90. **P. Zhang** and G. Yu, *Study of one-dimensional flow analysis model of the combustor in supersonic combustion experiments*. Experiments and Measurements in Fluid Mechanics 2003. 17(1): p. 88-92.

91. Y. Zhang, M. Zhang, S. Xu\*, and **P. Zhang**, *Numerical investigation on blast wave propagation and dynamic response of an explosion vessel*. Explosion and Shock Waves, 2003. 23(4): p. 331-336.
92. P. Yue, S. Xu\*, and **P. Zhang**, *Numerical study on a moving shock diffracted over the cylinder/square column in hydrogen air mixture*. Chinese Journal of Computational Physics, 2001. 18(1): p. 10-16.

#### **Patent (in China)**

1. R. Li, **P. Zhang**, R. Qian, J. Bao, X. Zhu, L. Ma, and B. Li, *An Axial Swirler with Center Flow Injectors*. Chinese Patent number: ZL 2013 2 0727294.9, 2013: P. R. China.

#### **Knowledge/Technology Transfer (in China)**

1. Institute of Mechanics, Chinese Academy of Sciences, 2013 – 2014, RMB 150K  
*Reduced Chemical Reaction Mechanism for the Pyrolysis of Kerosene Surrogates*

#### **Invited Departmental Seminars**

1. *Non-axisymmetric flow characteristics in Head-on Collision of Spinning Droplets*, State Key Laboratory of Engines, Tianjin University, October 31, 2020 (online).
2. *Vortex Dynamics in Droplet Coalescence and Mixing*, Institute of Applied Physics & Computational Mathematics Beijing, August 19, 2019.
3. *Multi-scale and Multi-physics Simulation and Modelling of Binary Droplet Collision in Gaseous Environment*, Institute of Applied Physics & Computational Mathematics Beijing, August 19, 2019.
4. *Towards Quantitatively Predictive Multiphase Combustion Simulation: Studies on Droplet Dynamics and Chemical Kinetics*, Xi'an Aerospace Propulsion Institute, September 25, 2019.
5. *Vortex Dynamics in Droplet Coalescence and Mixing*, Xi'an Jiaotong University, Xi'an, December 26, 2019.
6. *Towards Quantitatively Predictive Multiphase Combustion Simulation: Studies on Droplet Dynamics and Chemical Kinetics*, Xi'an Jiaotong University, Xi'an, November 29, 2019.
7. *On the Roles of Liquid Viscosity in Droplet Spreading on a Smooth Solid Surface*, Shanghai Jiao Tong University, Shanghai, 19 December 2019.
8. *Collision Dynamics of Binary Liquid Droplets in Gaseous Environment*, School of Energy and Power Engineering, Dalian University of Technology, Dalian, May 19, 2017.



9. *Theory of Circulation-controlled Firewhirl*, Center for Combustion Energy, Tsinghua University, Beijing, April 20, 2017.
10. *Binary Droplet Collision in Gaseous Environment: Theory, Simulation and Applications*, Physical Science and Engineering Division, King Abdullah University of Science and Technology, 5 December 2016.
11. *Quantum Chemistry and Chemical Kinetics for Hydrogen Abstraction Reactions of Large Straight-Chain Alkanes in Aviation Kerosene*, Institute of Mechanics, Chinese Academy of Sciences, Beijing, August 10, 2016.
12. *Problems on Droplet Collision and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, Chinese Academy of Engineering Physics, Beijing, July 6, 2015.
13. *Collision Dynamics and Internal Mixing of Droplets of Non-Newtonian Fluids*, College of Engineering, Peking University, Beijing, July 2, 2015.
14. *Dynamics of Binary Droplet Collision: Multiscale and Multiphysics Modeling*, Department of Mathematics, City University of Hong Kong, Hong Kong, April 30, 2014.
15. *Studies on Fluid Mechanics and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, Department of Aerospace Engineering, Huazhong University of Science and Technology, April 28, 2013.
16. *Studies on Fluid Mechanics and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, Laboratory of Explosion Science and Technology, Beijing Institute of Technology, January 25, 2013.
17. *Studies on Fluid Mechanics and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, Institute of Mechanics, Chinese Academy of Sciences, January 24, 2013.
18. *Studies on Fluid Mechanics and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, School of Jet Propulsion, Beihang University, March 10, 2012
19. *Bouncing, coalescence and separation in head-on collision of unequal-size droplets*, Cornell Fluid Dynamics Seminars, Sibley School of Mechanical and Aerospace Engineering, Cornell University, February 14, 2012.
20. *Weakly Rarefied Flows with Surface Reactions*, Center for Combustion Energy, Tsinghua University, December 22, 2011.
21. *Dynamics of Binary Droplet Collision*, INM 2011 Annual Meeting, Institute of Mechanics, Chinese Academy of Sciences, December 17, 2011.

22. *Studies on Fluid Mechanics and Chemical Kinetics for Application in Gelled Hypergolic Propellants*, Department of Thermal Engineering, Tsinghua University, December 2, 2011.
23. *Studies on fluid mechanics and chemical kinetics for application in biofuel combustion*, Department of Mechanical Engineering, the Hong Kong Polytechnic University, November 23, 2011.
24. *Studies on fluid mechanics and chemical kinetics for application in gelled hypergolic propellants*, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, April 14, 2011.
25. *Problems in droplet collision and rarefied flows*, Cornell Fluid Dynamics Seminars, Sibley School of Mechanical and Aerospace Engineering, Cornell University, October 26, 2010.
26. *Theory of head-on droplet collision: bouncing, coalescence and interface evolution*, Fluid Dynamics Seminar, Department of mathematical sciences, New Jersey Institute of Technology, February 11, 2008.

### **Invited Conference Talks**

1. *Multi-scale Physics of Binary Droplet Collision in Gaseous Environment*, Invited Topic Review, 2019 China National Symposium on Combustion, Tianjin, October 26, 2019.
2. *Towards Quantitatively Predictive Reaction Mechanisms of Hypergolic Propellants*, Hypergolic Liquid Rocket Engine and Spray Combustion Workshop, Northwestern Polytechnic University, Xi'an, January 18-21, 2018.
3. *Hypergolic Ignition by Droplet Collision of N,N,N',N'-tetramethylethylenediamine and White Fuming Nitric Acid Droplets*, State Key Laboratory of High-temperature Gas Dynamics Summer Workshop, Chinese Academy of Sciences, August 17, 2017.
4. *Towards High-level Theoretical Chemical Kinetics of Large-molecule Fuel Combustion*, The Chinese Congress of Theoretical and Applied Mechanics (CCTAM 2017), Beijing, August 13-16, 2017
5. *Collision Dynamics of Binary Liquid Droplets in Gaseous Environment*, Workshop on Vehicular Power System and Control, Beijing Institute of Technology, Beijing, December 11-13, 2016.
6. *On Pressure-dependent Unimolecular Reaction Rate Constants: Time-dependent Multiple-Well Master Equation and Its Solutions*, the 2<sup>nd</sup> National Young Scholar Meeting on Combustion Research, Hefei, April 09-10, 2016.

7. *Hypergolic Ignition by Head-on Collision of N,N,N',N'-tetramethylethylenediamine and White Fuming Nitric Acid Droplets*, the 6<sup>th</sup> East Asia Mechanical and Aerospace Engineering Workshop, Taiwan, June 2-4, 2016.
8. *Multi-scale and multi-physics modeling of binary droplet collision*, 2014 National Multiscale Mechanics Workshop, Zhejiang University, April 18, 2014.
9. *Ab initio kinetics for the decomposition of hydroxybutyl and butoxy radicals of n-butanol*, The International Workshop on Frontiers of Combustion Chemistry, Yellow Mountain, Anhui. September 27, 2013.
10. *Ab initio kinetics for the decomposition of  $\alpha$ -hydroxybutyl radical of n-butanol*. The 13th National Conference on Chemical Kinetics and Reaction Dynamics. Wuhu, Anhui, 2013.

## International Conference Publications

1. C. He, Y. Chi, and **P. Zhang\***, *Approximate Reconstruction of Torsional Potential Energy Surface based on Voronoi Tessellation*. The 38th International Symposium on Combustion, Adelaide, Australia, Jan. 2021.
2. C. He and **P. Zhang\***, *A Computational Study of Spinning Effects on Bouncing and Coalescence of Head on Colliding Droplets*, ILASS (Institute for Liquid Atomization and Spray Systems)-Asia, Zhengjiang, China, Oct. 2020. **Best Paper Award**, <https://www.polyu.edu.hk/me/me-phd-graduate-won-best-paper-award-in-21st-ilass-asia-2020/>
3. Z. Zhang, C. Zhang and **P. Zhang\***, *Numerical simulation of droplet spreading at small Weber numbers*, ILASS (Institute for Liquid Atomization and Spray Systems)-Asia, Zhengjiang, China, Oct. 2020.
4. K. Wu, **P. Zhang**, and X. Fan\*, *Modeling Analysis on Cavity-based Flame Stabilization in Scramjet Combustor*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July.
5. T. Yang, X. Xia, and **P. Zhang\***, *Flickering Mode Transition of Dual Pool Flames*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July. **The ASPCC Young Investigator Award**.
6. C. He and **P. Zhang\***, *Revised Multi-structural Approximations Including Torsional Anharmonicity for Partition Function Estimation*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July.
7. Q. Meng, Y. Chi, L. Zhang\*, **P. Zhang\***, and L. Sheng, *A Theoretical Study on the Isomerization and Dissociation Kinetics of Methyl Decanoate Radicals*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July.
8. Q. Meng, Q. Chen, L. Zhang, and **P. Zhang\***, *Effects of Torsional Anharmonicity in the Reaction Rate Constants of Methylbutanoate with Hydroperoxyl Radical*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July.
9. Y. Chi, Q. Meng, L. Zhang, and **P. Zhang\***, *High-level Thermochemistry Study of Hydrogen Abstraction Reactions of Large Straight-chain Alkanes Molecules by Hydrogen, Hydroxyl and Hydroperoxyl Radicals*, 12th Asia-Pacific Conference on Combustion 2019, Fukuoka, 1-5 July.
10. X. Xia and **P. Zhang\***, *Vortex Sheet Formation of Flickering Buoyant Diffusion Flames*, The 8th East Asia Mechanical and Aerospace Engineering Workshop 2018.
11. Z. Zhang and **P. Zhang\***, *A Practical Pressure-dependent Droplet Collision Model for Lagrangian Simulation of Impinging Sprays under High Ambient Pressures*, The 8th East Asia Mechanical and Aerospace Engineering Workshop 2018.

12. C. He, X. Xia and **P. Zhang\***, *Viscous Dissipation of Bouncing of Bouncing Droplets Undergoing Off-center Collision*, The 8th East Asia Mechanical and Aerospace Engineering Workshop 2018.
13. Y. Chi, Y. Zhu, Q. Meng, L. Zhang, and **P. Zhang\***, *Towards High-level Theoretical Studies of Aviation Kerosene Molecules: An ONIOM[QCISD(T)/CBS:DFT] Study on Hydrogen Abstraction Reaction of Large Straight-chain Alkanes Molecules  $C_nH_{2n+2}$  + (H,OH,HO<sub>2</sub>) Radicals*. The 8th East Asia Mechanical and Aerospace Engineering Workshop 2018.
14. D. Yu and **P. Zhang\***, *Lewis number effect on the flame height of circulation-controlled firewhirls*, The 11<sup>th</sup> Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December 2017.
15. D. Zhang and **P. Zhang\***, *Hypergolic Ignition Induced by Binary Collision of TMEDA and WFNA Droplets: Non-monotonic Effects of Impact Parameter*, The 11<sup>th</sup> Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December 2017. [The ASPCC Young Investigator Award, https://www.polyu.edu.hk/me/me-phd-graduate-won-young-investigator-award-in-11th-asia-pacific-conference/](https://www.polyu.edu.hk/me/me-phd-graduate-won-young-investigator-award-in-11th-asia-pacific-conference/)
16. X. Zhu, X. Xia, and **P. Zhang\***, *Flow and Flame Dynamics of Confined Buoyant Inverse Diffusion Flames*, The 11<sup>th</sup> Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December 2017.
17. C. He, J. Zhao, D. Yu, and **P. Zhang\***, *Unequal-size Droplet Collision and Internal Mixing*, The 8<sup>th</sup> European Combustion Meeting, Dubrovnik, Croatia, 18-21 April 2017.
18. D. Yu and **P. Zhang\***, *On the flame height of circulation-controlled firewhirls: a unified analysis of combining power-law vortex and variable physical properties*, The 8<sup>th</sup> European Combustion Meeting, Dubrovnik, Croatia, 18-21 April 2017.
19. K. Wu, P. Zhang\*, W. Yao and X. Fan, *LES Study of Flame Stabilization in DLR Hydrogen Supersonic Combustor with Strut Injection*, The 21st AIAA International Space Planes and Hypersonic Systems and Technology Conference, Xiamen, China, 3-9 March 2017.
20. **P. Zhang\***, *Collision Dynamics and Internal Mixing of Equal-size Droplets of Non-Newtonian Liquids Droplets*, ASME 2016 Heat Transfer, Fluids Engineering, & Nanochannels, Microchannels, and Minichannels Conferences, Washington DC, USA, 10-14 July 2016.
21. Z. Zhang, Y. Chi, and **P. Zhang\***, *On the role of droplet bouncing in modeling impinging sprays under elevated pressures*, in *The 13th International Conference on Combustion & Energy Utilization*. 2016: Taipei, Taiwan.
22. C. Tang, J. Zhao, **P. Zhang\***, C.K. Law, and Z. Huang, *Dynamics of Internal Jets in the Merging of Two Droplets of Unequal Sizes*, in *The 8th Across Strait Symposium on Shock Waves/Complex Flows*. 2016: Hong Kong University of Science and Technology, Hong Kong.

23. D. Zhang, **P. Zhang\***, Y. Yuan, and T. Zhang, *Hypergolic Ignition by Head-on Collision of N,N,N'N'-tetramethylethylenediamine and White Fuming Nitric Acid Droplets*, in *The 6th East Asia Mechanical and Aerospace Engineering Workshop*. 2016: National Cheng Kung University, Tainan.
24. Q. Chen, L. Zhang, and **P. Zhang\***, *A Theoretical Kinetics Study of the Reactions of Methylbutanoate with Hydroperoxyl Radical*, in *10th Asia-Pacific Conference on Combustion*. 2015: Beijing.
25. D. Yu, H. Gu, and **P. Zhang\***, *An Energy Integral Method Analysis of Preferred Modes and the Spreading Rates of Supersonic Circular Jets*, in *10th Asia-Pacific Conference on Combustion*. 2015: Beijing.
26. X. Zhu, **P. Zhang\***, R. Li, D. Li, and R. Qian, *Experimental Study and Numerical Simulation on a Cross-Drilled Swirl Combustor*, in *10th Asia-Pacific Conference on Combustion*. 2015: Beijing.
27. **P. Zhang\***, D. Liu, and C.K. Law, *Vortex Jet Formation Upon Coalescence of Unequal-size Droplets*, in *The 7th Across-Strait Workshop on Shock/Vortex Interaction*. 2014: Tamkang University, Taipei.
28. K. Sun, T. Wang, **P. Zhang\***, and C.K. Law, *Non-Newtonian Flow Effects on the Coalescence and Mixing of Initially Stationary Droplets of Shear-Thinning Fluids*, in *The 4th East Asia Mechanical and Aerospace Engineering Workshop*. 2014: The Hong Kong Polytechnic University, Hong Kong.
29. **P. Zhang\***, *Dynamics of Binary Droplet Collision*, in *HKSTAM Annual Conference*. 2013: University of Macau.
30. **P. Zhang\***, S.J. Klippenstein, and C.K. Law, *Ab initio kinetics for the decomposition of  $\alpha$ -hydroxybutyl radical of n-butanol*, in *The International Workshop on Frontiers of Combustion Chemistry*. 2013: Yellow Mountain, Anhui.
31. S.W. Yoo, S.W. Chaudhuri, **P. Zhang**, D.L. Zhu, and C.K. Law\*, *Response of Spherical Diffusion Flames Subjected to Rotation: Microgravity Experimentation and Computational Simulation*, in *The 7th U.S. National Combustion Meeting*. 2011: Atlanta, GA.
32. H. Sun, **P. Zhang**, and C.K. Law\*, *Thermal decomposition of monomethylhydrazine ( $\text{CH}_3\text{NHNH}_2$ ): Reaction mechanism and kinetic modeling*, in *The 7th U.S. National Combustion Meeting*. 2011: Atlanta, GA.
33. C. Tang, **P. Zhang**, and C.K. Law\*, *On head-on collision of unequal-sized droplets: Regime diagram and internal mixing upon coalescence*, in *The 7th U.S. National Combustion Meeting*. 2011: Atlanta, GA.

34. **P. Zhang**, S.J. Klippenstein, and C.K. Law\*, *Ab initio kinetics for the decomposition of  $\alpha$ -hydroxybutyl radical of n-butanol*, in *2011 Fall Technical Meeting of the Eastern States Section of the Combustion Institute*. 2011: University of Connecticut.
35. **P. Zhang**, H. Sun, and C.K. Law\*, *Secondary channels in the thermal decomposition of monomethylhydrazine ( $\text{CH}_3\text{NHNH}_2$ )* in *The 7th U.S. National Combustion Meeting*. 2011: Atlanta, GA.
36. **P. Zhang** and C.K. Law\*, *Density Functional Theory Study of the Ignition Mechanism for Dimethylaminoethylazide ( $\text{C}_4\text{H}_{10}\text{N}_4$ , DMAZ)* in *2011 Fall Technical Meeting of the Eastern States Section of the Combustion Institute*. 2011: University of Connecticut.
37. T. Zhang, **P. Zhang**, C.K. Law\*, and F. Qi, *CVD in weakly rarefied rotating-disk flows*, in *The 6th U.S. National Combustion Meeting*. 2009: Ann Arbor, MI.
38. **P. Zhang** and C.K. Law\*, *An ignition and extinction analysis for rotating-disk flame CVD reactor*, in *The 6th U.S. National Combustion Meeting*. 2009: Ann Arbor, MI.
39. **P. Zhang** and C.K. Law\*, *A fitting formula for pressure and temperature dependence of unimolecular reaction rate constants*, in *The 6th U.S. National Combustion Meeting*. 2009: Ann Arbor, MI.
40. **P. Zhang** and C.K. Law\*, *A fitting formula for the falloff curves of unimolecular reactions with tunneling*, in *2009 Fall Technical Meeting Eastern States Section of the Combustion Institute*. 2009: Maryland University.
41. D. Liu, **P. Zhang**, C.K. Law\*, and Y. Guo, *Collision dynamics and mixing of unequal-size droplets*, in *2009 Fall Technical Meeting Eastern States Section of the Combustion Institute*. 2009: Maryland University.
42. **P. Zhang** and C.K. Law\*, *Theory of bouncing and coalescence in droplet collision*, in *The 5th U.S. National Combustion Meeting*. 2007: San Diego, CA.
43. **P. Zhang** and C.K. Law\*, *Role of the Knudsen layer in determining surface reaction rates based on sticking coefficients*, in *2007 Fall Technical Meeting Eastern States Section of the Combustion Institute*. 2007: Virginia University.
44. **P. Zhang** and C.K. Law\*, *Theory of head-on collision of binary droplets: bouncing, coalescence and interface evolution*, in *The 2007 APS DFD Annual Meeting*. 2007: Salt Lake City, UT.

## Conference Publications (in Chinese)

1. Z. Zhang, C. Zhang and **P. Zhang\***, Numerical simulation of droplet spreading at small Weber numbers, 2020 National Symposium on Combustion, Xiamen, China, Nov. 2020.
2. Y. Chi, Q. Meng, L. Zhang, and **P. Zhang\***, *High-level Theoretical Thermochemistry Study on Hydrogen Abstraction Reactions of Large Straight-chain Alkanes Molecules  $C_nH_{2n+2} + (H, OH, HO_2)$  Radicals*, China National Symposium on Combustion 2018.
3. Q. Wu, Y. Li\*, N. Kang, and **P. Zhang**, Impact Analysis of Gas Compressibility to High-speed Oil Droplet in Secondary Breakup, China National Symposium on Combustion 2018.
4. Y. Chi, Y. Zhu, Q. Meng, L. Zhang, and **P. Zhang\***, *An ONIOM-method-based High-level Theoretical Study on Hydrogen Abstraction Reactions of Large Straight-chain Alkanes Molecules by Hydrogen Radical*, 2017 China National Symposium on Combustion, Nanjing, October 12-16, 2017. [Best Poster Award](#)
5. D. Yu and **P. Zhang\***, *Lewis number effect on the flame height of circulation-controlled firewhirls*, 2017 China National Symposium on Combustion, Nanjing, October 12-16, 2017.
6. X. Xia, C. He, D. Yu, and **P. Zhang\***, *Vortex-Ring-Induced Internal Mixing During Merging Of Two Stationary Droplets*, The Chinese Congress of Theoretical and Applied Mechanics (CCTAM 2017), Beijing, August 13-16, 2017.
7. D. Zhang and **P. Zhang\***, *Pressure-dependent Unimolecular Reactions of Benzyl Radical*, The 2nd National Combustion Chemistry Conference, Dalian, China, 19-21 May 2017.
8. D. Zhang and **P. Zhang\***, *Experimental Study on Hypergolic Ignition by N, N, N', N'-tetramethylethylenediamine and White Fuming Nitric Acid Droplet Collision*, in *2016 Annual Conference of Chinese Society of Engineering Thermophysics*. 2016: Ma'AnShan, Anhui.
9. D. Zhang, **P. Zhang\***, Y. Yuan, and T. Zhang, *Collision Dynamics of Hypergolic Propellant Droplets*, in *The 9th Conference of Chinese Society of Fluid Mechanics*. 2016: Nanjing, Jiangsu.
10. Q. Chen, L. Zhang, and **P. Zhang\***, *A Theoretical Kinetics Study of the Reactions of Methylbutanoate with Hydroperoxyl radical*, in *2015 Annual Conference of Chinese Society of Engineering Thermophysics*. 2015: Beijing.
11. L. Zhang and **P. Zhang\***, *Towards High-level Theoretical Studies of Large Biodiesel Molecules: An ONIOM [QCISD(T)/CBS:DFT] Study of Hydrogen Abstraction Reactions of  $C_nH_{2n+1}COOC_mH_{2m+1} + H$* , in *The 7th National Conference on Hypersonic Science and Technology*. 2014: Beijing.



12. **P. Zhang\***, L. Zhang, and C.K. Law, *Density Functional Theory Study of the Reactions of 2-Azido-N, N-Dimethylethanamine with Nitric Acid and Nitrogen Dioxide*, in *2014 Annual Conference of Chinese Society of Engineering Thermophysics*. 2014: Xi'an.
13. **P. Zhang\***, X. Fan, and G. Yu, *On Droplet Breakup in Supersonic Flows*, in *The 6th National Conference on Hypersonic Science and Technology*. 2013: Tengchong, Yunnan.
14. S. Xu\*, **P. Zhang**, Y. Zhang, and X. Zhang, *Preliminary numerical investigation of the shockwave-shell interaction in an explosion vessel*, in *The 1st National Numerical Explosion Mechanics Meeting*. 2000: Lushan, Jiangxi.
15. Y. Zhang, P. Yue, S. Xu\*, and **P. Zhang**, *Preliminary numerical study of the dynamic response of a vessel shell to impact load*, in *The 7th National Aeroelasticity Meeting*. 2000: Huzhou, Zhejiang.