

Kyuho Van

Vivian Hall (VHE) 20M – University of Southern California, CA 90018

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EDUCATION

Pukyong National University (PKNU) in South Korea

BS in Double major in Mechanical Engineering and Nanotechnology Engineering 2016

MS in Mechanical Engineering

Thesis: Flame Stability in Lifted Flames 2018

King Adullah University of Science and Technology (KAUST) in Saudi Arabia

Visiting Researcher in Clean Combustion Research Center (CCRC) 2017

University of Southern California (USC)

PhD in Mechanical Engineering 2026

Advisor: Fokion. N. Egolfopoulos

Thesis: Determination of Fundamental Combustion Properties at High Pressure and Temperature Conditions

WORK EXPERIENCE

Associate Researcher Mar. 2018 - Mar. 2019

Institute of Industrial Science and Technology

Associate Researcher Mar. 2019 – Oct. 2019

Korea Institute of Industrial Technology (KITECH)

Associate Research May. 2020 – Dec. 2020

Dept. of Material Science, PKNU

Postdoc Research Associate Present

University of Southern California, Energy and Reacting Flow Research Group

Advisor: Rui Xu

TEACHING EXPERIENCE

Dept. of Aerospace and mechanical Engineering, USC 2022- 2026

- AME 231: Mechanical Behavior of Materials (2022 – spring semester)
- AME 341a: Mechatronics Laboratory I (2022 – fall semester)
- AME 341b: Mechatronics Laboratory II (2023 – spring semester)
- AME 341a: Mechatronics Laboratory I (2023 – fall semester)
- AME 341b: Mechatronics Laboratory II (2024 – spring semester)
- AME 341a: Mechatronics Laboratory I (2024 – fall semester)
- AME 310: Thermodynamics (2025 – spring semester)
- AME 341a: Mechatronics Laboratory I (2025 – fall semester)
- AME 310: Thermodynamics (2026 – spring semester)

HONOR AND AWARDS

- **Outstanding Journal Paper Award** from Korean Society of Combustion, 2016
- **Outstanding Presentation Award**, 49th Symposium of the Korean Society of Combustion, 2016
- **Outstanding Presentation Award**, 55th Symposium of the Korean Society of Combustion, 2018
- **Outstanding Visualization Presentation Award** from 54th Symposium of the Korean Society of

Combustion, 2017

- **Combustion Institute Student Travel Award**, 38th International Symposium on Combustion, 2020

PUBLICATIONS

JOURNAL

International (corresponding author = *)

- [1] **Kyuho Van**, Kisung Jung, Chun Sang Yoo, Suhyeon Oh, Byeong Jun Lee, Min Suk Cha, Jeong Park*, Suk Ho Chung*, “Decreasing liftoff height behavior in laminar lifted methane jet flames diluted with nitrogen.” **Proc. Combust Inst.** 37(2) 2005-2012 (2019)
<https://doi.org/10.1016/j.proci.2018.05.031>
- [2] **Kyuho Van**, Jeong Park, Sung Hwan Yoon, Suk Ho Chung, Min Suk Cha*, Mechanism on oscillating lifted flames in nonpremixed laminar coflow jets” **Proc. Combust Inst.** 37(2) 1997-2004 (2019)
<https://doi.org/10.1016/j.proci.2018.07.052>
- [3] Hee June Kim, **Kyuho Van**, Kee Man Lee, Dae Keun Lee, Yung Tae Gwak, Sang In Keel, and Jeong Park*, “Effects of additional diluents on flame propagation speed and Markstein length in outwardly propagating CH₄/C₂H₄ flames” **J. Mech. Sci. Technol.** 32(11) 5501-5509 (2018)
<https://doi.org/10.1007/s12206-018-1048-1>
- [4] Hee June Kim, **Kyuho Van**, Kee Man Lee, Dae Keun Lee, Yung Tae Gwak, Jeong Park*, Suk Ho Chung*, “Laminar Flame, Markstein length, and Cellular Instability for Spherically Propagating Methane/ethylene-air Premixed Flame. **Combust. Flame.** 214 464-474 (2020)
<https://doi.org/10.1016/j.combustflame.2020.01.011>
- [5] **Kyuho Van**, Suhyeon Oh, Kisung Jung, Chun Sang Yoo, Min Suk Cha, Jeong Park*, Suk Ho Chung*, “Effects of Schmidt Number on Non-monotonic Liftoff Height Behavior in Laminar Coflow-jet Flames with Diluted methane and ethylene.” **Proc. Combust. Inst.** (2021)
<https://doi.org/10.1016/j.proci.2020.06.344>
- [6] Suhyeon Oh, **Kyuho Van**, Chun Sang Yoo1, Min Suk Cha*, Jeong Park, Suk Ho Chung. “On the Oscillating Flame Characteristics in Nonpremixed Laminar Coflow-jets: An Experimental and Numerical Study.” **Proc. Combust. Inst.** (2021)
<https://doi.org/10.1016/j.proci.2020.06.355>
- [7] Suhyeon Oh, **Kyuho Van**, Jeong Park*, Oh Boong Kwon, Se Won Kim, Jin Han Yun, Sang In Keel, Suk Ho Chung*. “Effect of Diluents on Lifted Flame Characteristics in Laminar Nonpremixed Coflow Propane Jets.” **Combust. Flame.** (2021)
<https://doi.org/10.1016/j.combustflame.2020.08.044>
- [8] **Kyuho Van**, P.V.R.K. Ramacharyulu, Duck Hyun Youn, and Chang Woo Kim*. “Determining Anisotropic Reactive Facet of Ilmenite Photocatalyst with Hubbard *U* Assisted Density Functional Theory.” **Journal of Computational Materials Science** (2023)
<https://doi.org/10.1016/j.commatsci.2023.112024>
- [9] **Kyuho Van**, Anguo Hu, Jung Fang, Tushar Bera, Allen Aradi, and Fokion Egolfopoulos*. “Effect of hydrogen addition on the propagation and autoignition of methane/oxygen/inert mixtures under engine-relevant conditions.” **Combust. Flame.** (2024)
<https://doi.org/10.1016/j.combustflame.2023.113197>
- [10] **Kyuho Van***, Anguo Hu, Jung Fang, Tushar Bera, Allen Aradi, and Fokion Egolfopoulos. “Quantitative Studies of instabilities of confined spherically expanding flames: Application to flame propagation of natural gas blends with hydrogen at engine-relevant conditions.” **Combust. Flame.** (2025)
<https://doi.org/10.1016/j.combustflame.2025.114009>
- [11] **Kyuho Van***, Anguo Hu, Jung Fang, Tushar Bera, Allen Aradi, and Fokion Egolfopoulos. “Effects of End-Gas Reactivity on Fundamental Combustion Properties of Primary Reference Fuel Blends with Ethanol at Engine-Relevant Conditions.” **Combust. Flame.** (2025)
<https://doi.org/10.1016/j.combustflame.2025.114524>

- [12] Anguo Hu, **Kyuho Van***, Suhyeon Oh, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Propagation of Laminar Hydrogen Flames at High Pressures and Temperatures." **Combust. Flame** (2026).
<https://doi.org/10.1016/j.combustflame.2026.114953>
- [13] Wellington Brsitow, Suhyeon Oh, **Kyuho Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Propagation of hydrogen flame at engine conditions." **Accepted to 41st international symposium** and under preparation of submission to Combust. Flame.
- [14] Wellington Brsitow, Suhyeon Oh, **Kyuho Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "A numerical investigation of hydrogen flame instabilities at high pressures and temperatures." **Accepted to 41st international symposium** and under preparation of submission to Combust. Flame.
- [14] Suhyeon Oh, **Kyuho Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Propagation of laminar flames of gasoline-type fuels at engine conditions." **Accepted to 41st international symposium** and under preparation of submission to Combust. Flame.
- [15] Suhyeon Oh, **Kyuho Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Experimental investigation of end-gas reactivity effects on the propagation of primary reference fuels flames." **Accepted to 41st international symposium** and under preparation of submission to Combust. Flame.
- [16] Prakhar Joshi, **Kyuho Van***, and Fokion Egolfopoulos. "A computational study of aluminum droplet combustion and the transition between diffusion and kinetic regimes." **Accepted to 41st international symposium** and under preparation of submission to Combust. Flame.

South Korean

- [1] **Kyuho Van**, Won June Lee, Jeong Park*, Tae Hyung Kim, Jong Ho Park. "A study on self-excitation in laminar lifted coflow-jet flames" J. Korean Soc. Combust 20(1) 43-51 (2016).
<https://doi.org/10.15231/jksc.2015.20.1.043>
- [2] Bo Hyeon Seo, **Kyuho Van**, Gyeong Taek Kim, Jeong Park*, Sang In Keel, Se Won Kim, Suk Ho Chung. "Effect of AC Electric field on decreasing liftoff height in laminar lifted jet flames." J. Korean Soc. Combust 22(3) 17-22 (2017).
<https://doi.org/10.15231/jksc.2017.22.3.017>
- [3] Suhyeon Oh, **Kyuho Van**, Jeong Park*, Oh Boong Kwon, Suk Ho Chung, Se Won Kim. "Flame Behavior near Extinction limit in Laminar Flame" J. Korean Soc. Combust 24(1) 1-6 (2019).
<http://dx.doi.org/10.15231/jksc.2019.24.1.001>

CONFERENCE

International

- [1] **Kyuho Van**, Hee June Kim, Jeong Park, Oh Boong Kwon, Jeong Park, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong-Soon Noh. "Cellular instability and laminar burning velocity in CH₄/C₂H₄-air premixed flames." 11th Asia Microgravity Symposium (AMS). 25-29 October, Hokkaido University, Sapporo, Japan (2016).
- [2] **Kyuho Van**, Hee June Kim, Jeong Park, Oh Boong Kwon, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong-Soon Noh, "Cellular instability and laminar burning velocity in methane/ethylene-air premixed flames." 8th European Combustion Meeting (ECM). 18-21 April, Dubrovnik, Croatia (2017).
- [3] **Kyuho Van**. "Cellular instability and flame propagation speed in spherically expanding methane/ethylene-air premixed flames." 15th International Congress on Combustion By-Products and Their Health Effects (PIC). 27-30 June, Seoul, Korea (2017).
- [4] **Kyuho Van**, Narayan Sapkal, Jeong Park, Byeong Jun Lee, Suk Ho Chung. "Study on the lifted flame characteristics in non-premixed jet flames." 9th JSME-KSME Thermal and Fluid Engineering Conference (TFEC9), 28-30 October, Okinawa, Japan (2017).
- [5] Hee June Kim, **Kyuho Van**, Oh Boong Kwon, Jeong Park, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong-Soon Noh, "Dilution effect of laminar burning velocities and cellular instabilities in methane/ethylene-air premixed spherical flame." 9th JSME-KSME thermal and

- Fluid Engineering Conference (TFEC9). 28-30 October, Okinawa, Japan (2017).
- [6] **Kyuhoo Van**, Hee June Kim, Jeong Park, Oh Boong Kwon, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong-Soon Noh, "Propagation speed, Markstein length, and cellular instability of outwardly expanding methane/ethylene-air spherical premixed flames." 9th JSME-KSME thermal and Fluid Engineering Conference (TFEC9). 28-30 October, Okinawa, Japan (2017).
 - [7] Suhyeon Oh, **Kyuhoo Van**, Jeong Park, Oh Boong Kwon, Jin Han Yoon, Sang In Keel. "Flame behavior near extinction limit in laminar-lifted propane coflow jet flames diluted with nitrogen and helium." 9th JSME-KSME thermal and Fluid Engineering Conference (TFEC9). 28-30 October, Japan (2017).
 - [8] **Kyuhoo Van**, Bo Hyeon Seo, Jeong Park, Oh Boong Kwon, Gyeong Taek Kim, Narayan Sapkal, Suk Ho Chung. "Effects of applied electric fields on behavior of laminar lifted nitrogen-diluted methane coflow-jet flames." 9th JSME-KSME thermal and Fluid Engineering Conference (TFEC9). 28-30 October, Okinawa, Japan (2017).
 - [9] **Kyuhoo Van**, Hee June Kim, Jeong Park, Oh Boong Kwon, Dae Keun Lee, Seong Gon Kim, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong Sonn Noh, Suk Ho Chung. "Outwardly propagating spherical flame with cellular instability and laminar burning velocities in methane/ethylene/air premixed flames" 11th Asia-Pacific Conference on Combustion (ASPACC). 10-14 December, University of Sydney, Sydney, Australia (2017).
 - [10] **Kyuhoo Van**, Narayan Sapkal, Jeong Park, Suk Ho Chung. "Investigation of the stability and behavior of lifted tri-brachial flames." 11th Asia-Pacific Conference on Combustion (ASPACC). 10-14 December, University of Sydney, Sydney, Australia (2017).
 - [11] Suhyeon Oh, **Kyuhoo Van**, Oh Boong Kwon, Suk Ho Chung, Jin Han Yoon, Sang In Keel. "Flame behavior within transient regime in helium-diluted laminar-lifted coflow-jet flames." 11th Asia-Pacific Conference on Combustion (ASPACC). 10-14 December, University of Sydney, Sydney, Australia (2017).
 - [12] Hee June Kim, **Kyuhoo Van**, Jeong Park, Oh Boong Kwon, Dae Keun Lee, Seung Gon Kim, Young Tae Guahk, Dong-Soon Noh, "Effects of additional diluents on laminar burning velocities and cellular instabilities in outwardly propagating methane/ethylene-air premixed spherical flame." 11th Asia-Pacific Conference on Combustion (ASPACC). 10-14 December, University of Sydney, Sydney, Australia (2017).
 - [13] **Kyuhoo Van**, Kisung Jung, Chun Sang Yoo, Suhyeon Oh, Byeong Jun Lee, Min Suk Cha, Jeong Park, Suk Ho Chung, "Decreasing liftoff height behavior in laminar lifted methane jet flames diluted with nitrogen." 37th International Symposium on Combustion. 29 July – 3 August, Dublin, Ireland (2018).
 - [14] **Kyu Ho Van**, Jeong Park, Sung Hwan Yoon, Suk Ho Chung, Min Suk Cha, "Mechanism on oscillating lifted flames in nonpremixed laminar coflow jets." 37th International Symposium on Combustion. 29 July – 3 August, Dublin, Ireland (2018).
 - [15] Suhyeon Oh, **Kyuhoo Van**, Jeong Park*, Oh Boong Kwon, Se Won Kim, Jin Han Yun, Sang In Keel, Suk Ho Chung. "Effect of Additional Diluents on Liftoff Height in Laminar Diffusion Coflow-jet Flames" 12th Asia-Pacific Conference on Combustion (ASPACC). 1st -5th July, Fukuoka International Congress Center, Fukuoka (2019).
 - [16] **Kyuhoo Van**, Suhyun Oh, Kisung Jung, Chun Sang Yoo*, Min Suk Cha, Jeong Park*, Suk Ho Chung, "Effects of Schmidt Number on Non-monotonic Liftoff Height Behavior in Laminar Coflow-jet Flames with Diluted methane and ethylene." 38th International Symposium on Combustion. 29 Jan. 24 - 29, Adelaide, Australia (2021).
 - [17] **Kyuhoo Van***, Anguo Hu, Jung Z. Fang, Tushar K. Bera, Allen A. Aradi, Fokion N. Egolfopoulos. "Quantitative studies of instabilities of confined spherically expanding flames: Application to flame propagation and autoignition of natural gas reacting mixtures at engine-relevant conditions" Fall meeting of western states section of the combustion institute (WSCCI). October. 16-17th, Northridge CA (2023).
 - [18] Wellington Bristow, Suhyeon Oh, Anguo Hu, **Kyuhoo Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Propagation of hydrogen flame at engine conditions." 41st International Symposium on Combustion. July 26-31, Kyoto, Japan (2026).

- [19] Wellington Bristow, Suhyeon Oh, **Kyuhoo Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "A numerical investigation of hydrogen flame instabilities at high pressures and temperatures." 41st International Symposium on Combustion. July 26-31, Kyoto, Japan (2026).
- [20] Suhyeon Oh, **Kyuhoo Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Propagation of laminar flames of gasoline-type fuels at engine conditions." 41st International Symposium on Combustion. July 26-31, Kyoto, Japan (2026).
- [21] Suhyeon Oh, **Kyuhoo Van***, Ji-woong Park, Yuanjian Pei, and Fokion Egolfopoulos. "Experimental investigation of end-gas reactivity effects on the propagation of primary reference fuels flames." 41st International Symposium on Combustion. July 26-31, Kyoto, Japan (2026).
- [22] Prakhar Joshi, **Kyuhoo Van***, and Fokion Egolfopoulos. "A computational study of aluminum droplet combustion and the transition between diffusion and kinetic regimes" 41st International Symposium on Combustion. July 26-31, Kyoto, Japan (2026).

Advising and Mentoring Experience

- Provided technical guidance to Shell Global Inc. interns and MIT graduate students.
- Provided technical support and guidance for implementing the one-dimensional unsteady simulation codes in collaboration with Shell Global Inc.
- Provided technical guidance to M.S. students (Phani Kumar and Yi Wang) in the Department of Aerospace and Mechanical Engineering, University of Southern California.
- Provided technical guidance to Ph.D. students (Suhyeon Oh, Prakhar Joshi, and Wellington Bristow) in the Department of Aerospace and Mechanical Engineering, University of Southern California.

Academic Journal Reviewing Service

Manuscripts reviewed

- Combustion and Flame
- Fuel
- Combustion Science and Technology

Invited Talks

1. Determination of Fundamental Combustion Properties at High Pressure and Temperature Conditions, *Dept. of Aerospace and Mechanical Engineering, University of Southern California*, 2026

RESEARCH PROJECTS

United States

1. Ignition delay time and laminar flame speed measurement at engine relevant conditions.
Funding agency: Shell Global Inc
Duration: 2021.01 ~ 2024
Eligibility: Research Assistant, graduate student
2. Experimental Determination of Laminar Flame Speeds of Lean and Ultra-Lean Hydrogen Flames at Engine Relevant Conditions
Funding agency: Aramco
Duration: 2023.06 ~ 2024.12
Eligibility: Research Assistant, graduate student
3. Experimental Determination of Laminar Flame Speeds of Gasoline Fuels at Engine Relevant Conditions
Funding agency: Aramco
Duration: 2025.01 ~ present
Eligibility: Research Assistant, graduate student

South Korea

1. Study of Excess Enthalpy Flame Characteristic with Addition of VOCs and Diluent
Funding agency: Korea Institute of Energy Research, KIER
Duration: 2016.01~2016.10
Eligibility: Research Assistant, graduate student
2. Project name: Fuel evaluation of other fuels compared to methane in high pressure atmosphere
Funding agency: Korea Institute of Energy Research, KIER
Duration: 2017.01~2017.10
Eligibility: Research Assistant, graduate student
3. A Development of Near Zero Emission Combustion Technology for Industrial Boilers
Funding agency: Korea Energy Technology Evaluation and Planning
Duration: 2017.06 ~ 2018.02
Eligibility: Research Assistant, graduate student