WSS/CI Western States Section/Combustion Institute

2023 FALL TECHNICAL MEETING
WESTERN STATES SECTION OF THE COMBUSTION INSTITUTE
Hosted by California State University, Northridge - Northridge, CA

Monday, 16 October 2023

7:30 – 4:00 Registration: Lake View Terrace C - East Conference Center, 2nd Floor
7:30 – 8:00 Breakfast: Lake View Terrace C
8:00 - 8:20 Welcome Address in Lake View Terrace A: Houssam Toutanji, Dean, *College of Eng. and Computer Science, California State University, Northridge*
Welcome Remarks: Vinicius M. Sauer, *California State University, Northridge*
Bihter Padak, *University of California, Irvine*

8:20 – 9:20 Plenary Lecture in Lake View Terrace A: Josette Bellan, *Jet Propulsion Laboratory, NASA*
Title: *On multi-species mixing in turbulent high-pressure flows*
Session Chair: William A. Sirignano, *University of California, Irvine*

9:20 – 9:25	**Transition to Morning Sessions**	
	Fires I Tujunga **Session Chair: D. Chaudhari**	**Turbulent Flames** Van Nuys **Session Chair: V. McDonell**
9:25 – 9:45	**1A01:** Effect of fuel layer thickness on fire whirl emissions and burning rate *J.L. Dowling, W. Cui, M. Hajilou, J. Tan, M.J. Gollner*	**1B01:** Effect of mixing characteristics on efficiency of pulse plasma-assisted fuel reforming *S. Huang, S. Weng, C. Medchill, S.B. Cronin, P.D. Ronney*
9:45 – 10:05	**1A02:** Large Eddy Simulation of turbulent fire spread in a Douglas fir fuel array *P. Bevington, L. Shannon, S. Simons-Wellin, C.B. Lapointe, S. Coburn, G.B. Rieker, J. Farnsworth, P.E. Hamlington*	**1B02:** Proper boundary conditions for unsteady three-dimensional rotational flamelets *W.A. Sirignano*
10:05 – 10:25	**1A03:** Limiting oxygen concentrations of burning PMMA cylinders under external radiant heating and subatmospheric pressure *C. Liveretou, C. Scudiere, J. Rivera, C. Fernandez-Pello, M. Gollner, S. Olson, P. Ferkul*	**1B03:** Evaluation of a novel mixing model (HiPS) for transported PDF modeling *M. Behrang, D.O. Lignell*
10:25 – 10:45	**1A04:** The effect of different ambient pressures and external heating on oxygen depletion in confined fires *L. Etzenbach, C. Liveretou, J. Rivera, C. Fernandez-Pello, M. Gollner, S. Olson, P. Ferkul*	**1B04:** DNS study of flame speed enhancement in turbulent premixed hydrogen flames *M.X. Yao, G. Blanquart*
10:45 – 11:05	**1A05:** Modeling steady poly(methyl methacrylate) combustion in a narrow channel with varying opposed oxidizer flow velocity *T. Hesse, F. Miller, S. Olson, I. Wichman*	
11:05 – 11:20	**BREAK – Lake View Terrace C**	

	Stationary Combustion Tujunga **Session Chair: B. Padak**	**Numerical Methods and Machine Learning Techniques Applied to Combustion** Van Nuys **Session Chair: K. Niemeyer**
11:20 – 11:40	**1A06:** Investigation of flashback prevention in hydrogen-fueled water heaters *A.A. Navarro-Fuentes, T. Pham, W. Villatoro, B. Hickey, V. McDonell*	**1B06:** Exploring optimization methods for designing sustainable aviation fuels using data-driven property models *A.M. Martz, A.E. Comesana, V.H. Rapp, K.E. Niemeyer*
11:40 – 12:00	**1A07:** Effect of hydrogen addition into natural gas on selective catalytic reduction of NO_x in power plants *K. Horiuchi, S. Faraji, B. Padak*	**1B07:** Application of machine learning to laser induced break spectroscopy in flame spray pyrolysis *C. Wang, B. Ko, M.O. Najimu, E. Sasmaz*
12:00 – 12:20	**1A08:** Characterization of crankcase ventilation gas on stationary natural gas engines *A.E. Quintero Castillo, A. Zdanowicz, B. Windom, D.B. Olsen*	**1B08:** Extending generalized preconditioning to accelerate simulations of coupled reactor and surface systems *A.S. Walker, R.L. Speth, K.E. Niemeyer*
12:20 – 12:40		**1B09:** Real-time laser absorption spectroscopy using FPGA-based machine learning for 10 kHz intra-cycle emissions detection towards adaptive reciprocating engines *K.K. Schwarm, R. Mitchell Spearrin*
12:40 – 1:55	**LUNCH –** ON YOUR OWN **Women in Combustion Lunch –** La Crescenta	
	Fires II Tujunga **Session Chair: A. Josephson**	**Laminar Flames** Van Nuys **Session Chair: J. Santner**
1:55 – 2:15	**1A10:** Effects of oxygen availability, ventilation flow rate, and fuel bed structure on wood crib burning *S. McAllister, E. Belmont, K. Walker*	**1B10:** Characteristics of H_2-O_2-N_2 flame in quasi-2D channels: Propagation rates and scaling parameters *Z. Zhou, B. Cohen, P. Ronney*
2:15 - 2:35	**1A11:** Exploring the capability of FDS to predict fire growth over combustible solids in a corner configuration. *D.M. Chaudhari*	**1B11:** Non-unity Lewis number simulations of a low Reynolds number jet diffusion flame in crossflow *S. Simons-Wellin, C.B. Lapointe, S. Coburn, S. Sheppard, J.A. Farnsworth, G.B. Rieker, P.E. Hamlington*
2:35 - 2:55	**1A12:** Assessing the burning behavior of live salal leaves for wildfire like convective heat flux *A. Singh, N. Gardner, D.L. Blunck*	**1B12:** Dynamics of counterflow flame under oscillating strain rates *J.G. Rivera Lizarralde, A. Potnis, A. Saha*
2:55 – 3:15	**1A13:** TG-FTIR-GC/TCD study of pyrolysis of Douglas-fir foliage *M.W. Andersen, D.L. Blunck, C.L. Hagen*	**1B13:** Quantitative studies of instabilities of confined spherically expanding flames: Application to flame propagation of natural gas blends with hydrogen at engine-relevant conditions *K. Van, A. Hu, J.Z. Fang, T.K. Bera, A.A. Aradi, F.N. Egolfopoulos*
3:15 – 3:35	**1A14:** Ignition and burning behavior of live and dead thermally thick woody fuels *N. Gardner, D.L. Blunck*	**1B14:** Electric field induced flame shape transitions of a premixed laminar flame *D.L. Cruise, A. Satija, G.B. King*

3:35 - 3:50	**BREAK -** Lake View Terrace C	
	Fires III Tujunga **Session Chair: A. Josephson**	**Laminar Flames/Reaction Kinetics** Van Nuys **Session Chair: K. P. Shrestha**
3:50 - 4:10	**1A15:** Hydrogen fluoride formation in synthetic composite fires with fluoropolymers via laser absorption spectroscopy *I.C. Sanders, K.A. Oberlander, N.M. Kuenning, R. Mitchell Spearrin*	**1B15:** Validation of an externally heated diverging channel for flame speed measurement *A. Hernandez, D.H. Han, A. Zarate, I. Ron, O. Vaca, A. Olmos Saldivar, M. Canova, J. Santner*
4:10 - 4:30	**1A16:** Transitional behavior from opposed flame spread to fuel-regression in confined environments *J. Rivera, L. Etzenbach, C. Liveretou, C. Fernandez-Pello, M. Gollner, S. Olson, P. Ferkul*	**1B16:** Three-dimensional vorticity effects on the extinction behavior of JP-5 - air laminar flamelets *W. Hellwig, X. Shi, W.A. Sirignano*
4:30 - 4:50	**1A17:** Thick fuel combustion in QUIC-fire *A.J. Josephson, R.R. Linn, W.M. Jolly, S. Brambilla*	**1B17:** Theoretical analysis of the kinetics of the first reactions in peroxide-based explosives *K.P. Shrestha, M.J. Cawkwell, V.W. Manner*
4:50 – 5:10	**1A18:** Modeling heat transfer in void generating foam decomposition *A. Murphy, M. Kury*	**1B18:** A new jet-stirred reactor for turbulent combustion and chemical kinetics experiments *J.-Y. Wang, P. Ronney*
5:10 – 5:30	**1A19:** Thermogravimetric analysis of peat *S. Scott, S. McAllister*	**1B19:** Systematically derived reduced kinetics for high-pressure H_2–NH_3 combustion *B. Li, D. Fernández-Galisteo, A.L. Sánchez, F.A. Williams*
6:00	**Reception –** Orchard Conference Center	
8:00	**Young Researcher Mixer –** 8one8 Brewing (one-way shuttle leaves at 8:00 pm)	

WSS/CI Western States Section/Combustion Institute

Tuesday, 17 October 2023

7:30 – 12:00 Registration: Lake View Terrace C - East Conference Center, 2nd Floor
7:30 – 8:00 Breakfast: Lake View Terrace C
8:00 - 8:05 Opening Remarks and Announcement in Lake View Terrace A: Vinicius M. Sauer, *California State University, Northridge*
8:05 – 9:05 Plenary Lecture in Lake View Terrace A: Paul Ronney, *University of Southern California*
Title: *Combustion experiments in the era of data-driven modeling and generative AI*
Session Chair: Fokion N. Egolfopoulos, *University of Southern California*

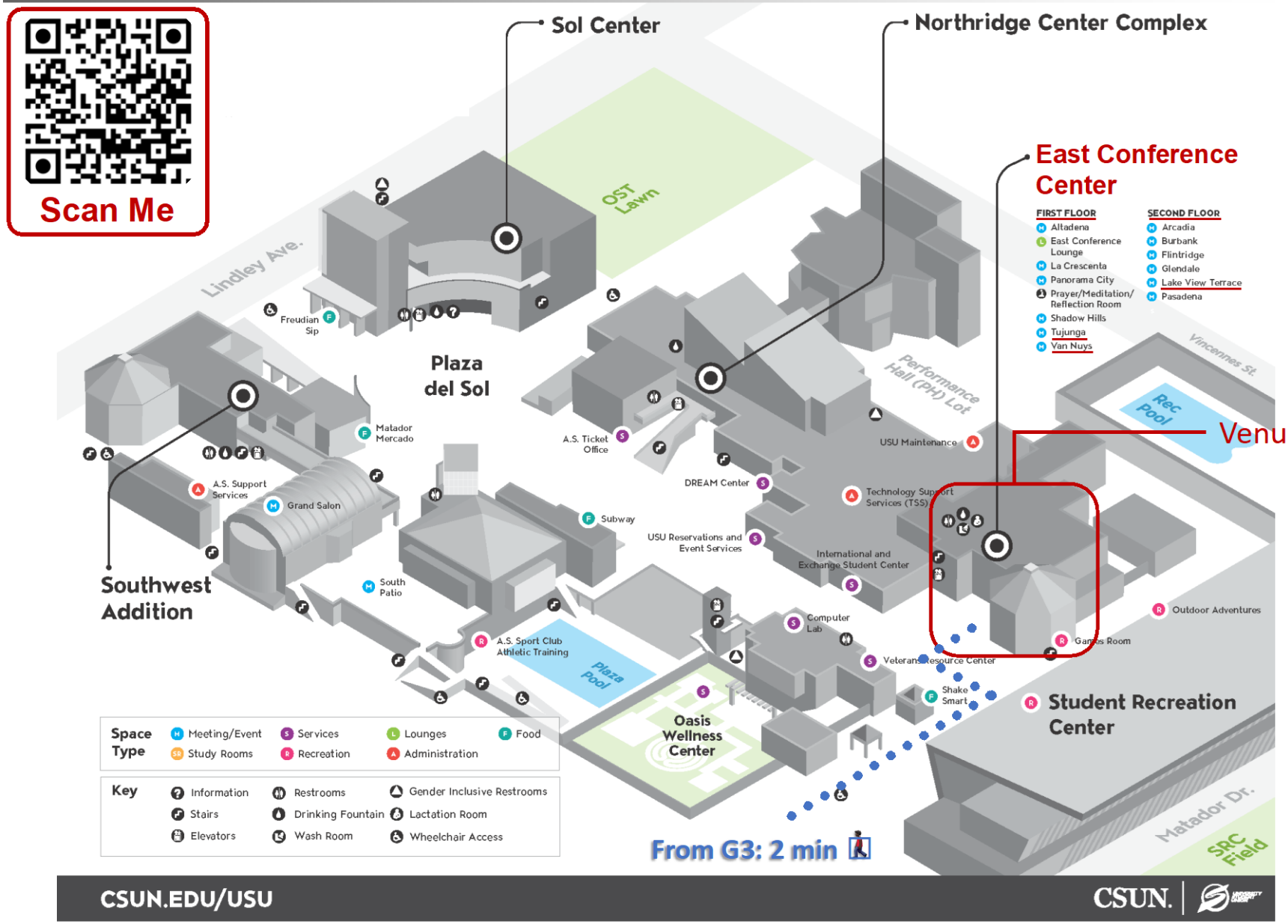
9:05 – 9:15	**Transition to Morning Sessions**	
	Internal Combustion, Gas Turbines, and Rocket Engines I Tujunga **Session Chair: A. Singh**	**Soot/Emissions** Van Nuys **Session Chair: Y. Zhao**
9:15 – 9:35	**2A01:** Impact of fuel injection parameters on performance and methane emissions in large bore engines *T. Banji, G. Arney, D. Olsen*	**2B01:** Quantifying the effect of chemical composition of five trees/shrubs on pollutant emissions *D. Sharma, D.L. Blunck*
9:35 - 9:55	**2A02:** Towards NO_x entitlement for lean pre-mixed hydrogen flames *M. Overbaugh, A. Fuentes, Q. Lin, W. Villatoro, V. McDonell*	**2B02:** Characterization of gas-phase soot precursors in premixed stagnation flames by probe sampling and GC-MS analysis *A. Ugalde, J. Camacho*
9:55 - 10:15	**2A03:** Thermal decomposition analysis of well-controlled recrystallized AP *C. Do, N. Smith, M. Phister, G. Giri, J. Kalman*	**2B03:** Light scattering study of soot produced by burning liquid fuel inside and outside a combustion chamber designed for hazardous materials *R. Ebini, C. Sorensen, D. Wiemann, T. Settecerri, J. Hubbard*
10:15 - 10:35	**2A04:** Improvements in performance, emissions, and combustion characteristics of a heavy-duty LPG engine using direct liquid injection *T. Fosudo, B. Windom, D. Olsen*	**2B04:** Non-powered commercial cooktop burners optimization for efficiency improvement/NOx reduction and hydrogen blending efforts *Y. Zhao, J. Pixler, B. Sutherland, N. Daniels, F. Johnson*
10:35 - 10:55	**2A05:** Asymmetric couplings in a multi-flame laminar Rijke tube *Y. Weng, Y. Zhu, A. Saha*	**2B05:** Transient analysis of natural gas pyrolysis and hydrogen yield via interband cascade laser absorption spectroscopy of methane, acetylene, ethylene, and ethane *B. Jeevaretanam, M. Abuseada, C. Wei, N. Minesi, T.S. Fisher, R. Mitchell Spearrin*
10:55 – 11:10	**BREAK -** Lake View Terrace C	

	Internal Combustion, Gas Turbines, and Rocket Engines II Tujunga **Session Chair: A. Singh**	**Sprays and Droplets/Detonations** Van Nuys **Session Chair: G. Blanquart**
11:10 – 11:30	**2A06:** Connecting injector mixing performance with NOx emissions through chemical reactor network analysis for operation of a recuperated gas turbine operated hydrogen/natural gas blends *W. Villatoro, O. Aguilar-Cerna, J. Slope, V. McDonell*	**2B06:** Numerical simulation of laminar counterflowing TTIP/*p*-xylene spray flames in air *Z. Ying, E. Gutheil*
11:30 – 11:50	**2A07:** Enhancing the performance of a small gasoline engine using hydrogen-enriched natural gas *M.E. Baumgardner, A. Graves, K. Hilt, L. Larson, C. Nordell*	**2B07:** Preferential vaporization effects on the ignition of multicomponent liquid droplets *W. Wang, F.N. Egolfopoulos*
11:50 – 12:10	**2A08:** Premixed ammonia combustion at high pressures *B. Esquivias, V. McDonell, M. Toqan, H. Abdul Sater*	**2B08:** Numerical study on the effect of Sustainable Aviation Fuel (SAF) composition on single droplet evaporation *Sreejith N.A., A. Binswanger, B. Perry, S. Yellapantula, M. Rahimi, M. Day*
12:10 - 12:30	**2A09:** Shear coaxial mixing and combustion of methane-oxygen examined by laser absorption tomography *A.R. Keller, F.A. Bendana, D.K. Kaialau, A.A. Perezselsky, A.C. Cortopassi, R. Mitchell Spearrin*	**2B09:** State-to-state vibrational kinetics for detonations *A.T. Carroll, A. Baumgart, M.X. Yao, G. Blanquart*
12:30 – 12:50	**2A10:** Emissions off ultra-high efficiency heavy-duty natural gas engine with C-EGAI *J.F. Rodriguez, B. Windom, D. Olsen*	**2B10:** Simulating detonations with tabulated chemistry in a spatially-filtered framework *A. Baumgart, M.X. Yao, A.T. Carroll, G. Blanquart*
12:50	**Adjourn** **JPL Tour individuals that signed up only leaves at 12:20, East Conference Center Lounge**	

2023 WSSCI Fall Technical Meeting Author List

Parking (US$ 10.45 daily)

Venue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East Conference Center
FIRST FLOOR
Altadena
East Conference Lounge
La Crescenta
Panorama City
Prayer/Meditation/ Reflection Room
Shadow Hills
Tujunga
Van Nuys
SECOND FLOOR
Arcadia
Burbank
Flintridge
Glendale
Lake View Terrace
Pasadena
Venue
Lindley Ave.
OST Lawn
Freudian Sip
Plaza del Sol
Performance Hall (PH) Lot
Vincennes St.
Rec Pool
Matador Mercado
A.S. Ticket Office
USU Maintenance
A.S. Support Services
Grand Salon
DREAM Center
Technology Support Services (TSS)
Subway
USU Reservations and Event Services
International and Exchange Student Center
Southwest Addition
South Patio
Computer Lab
Outdoor Adventures
A.S. Sport Club Athletic Training
Plaza Pool
Games Room
Veterans Resource Center
Shake Smart
Oasis Wellness Center
Student Recreation Center
Matador Dr.
SRC Field
Space Type
Meeting/Event
Services
Lounges
Food
Study Rooms
Recreation
Administration
Key
Information
Restrooms
Gender Inclusive Restrooms
Stairs
Drinking Fountain
Lactation Room
Elevators
Wash Room
Wheelchair Access
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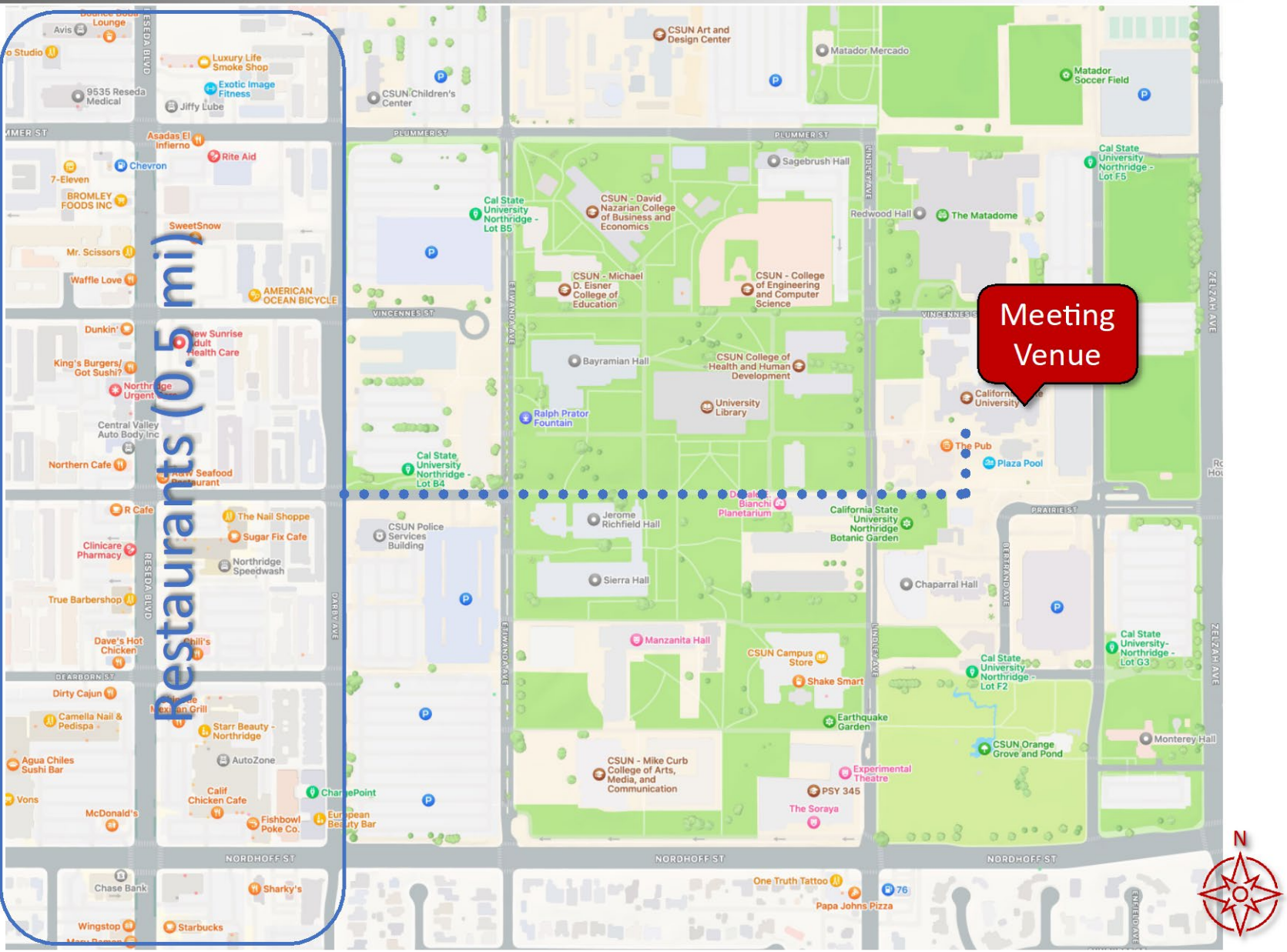
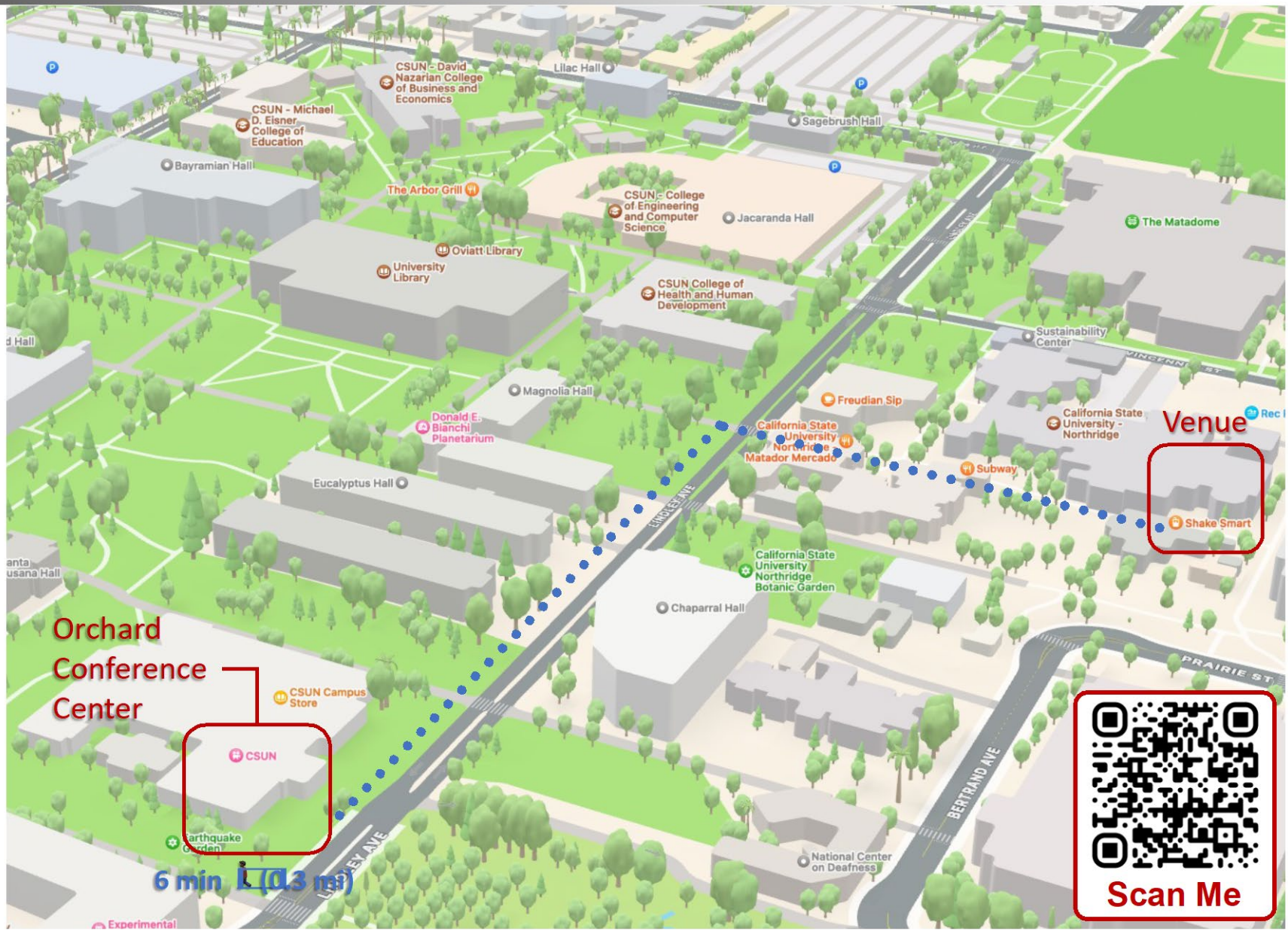
Dining (On Campus)

Dining (Off Campus)



Reception


CSUN - David Nazarian College of Business and Economics
Lilac Hall
CSUN - Michael D. Eisner College of Education
Sagebrush Hall
Bayramian Hall
The Arbor Grill
CSUN - College of Engineering and Computer Science
Jacaranda Hall
The Matadome
Oviatt Library
University Library
CSUN College of Health and Human Development
Sustainability Center
Magnolia Hall
Freudian Sip
Donald E. Bianchi Planetarium
California State University Northridge
Matador Mercado
Venue
Subway
Eucalyptus Hall
Shake Smart
California State University Northridge Botanic Garden
Chaparral Hall
Orchard Conference Center
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