



U.S. DEPARTMENT OF ENERGY  
**SOLAR DECATHLON**



# 2019 DESIGN CHALLENGE WEEKEND

APRIL 12-14, 2019

NATIONAL RENEWABLE ENERGY LABORATORY

## SOMETHING OLD? SOMETHING NEW? SOMETHING BORROWED? SOMETHING BLUE?

The Solar Decathlon 2019 Design Challenge has all of that and more. During the next three days, we are confident that you'll leave here with experience, knowledge, and friends unlike any other event. We hope that you'll take what you've learned as a stepping stone toward an amazing career.

We couldn't be more excited to have you at the U.S. Department of Energy Solar Decathlon Design Challenge Competition! Before we continue, please take a moment to reflect on all the hard work you completed to earn your attendance here. The competition's judging criteria rewards excellence in integrating building research findings, best practices, and principles of building science with great architectural design.

For the Design Challenge, teams compete against each other for awards in six Divisions for both residential and commercial buildings: Suburban Single-Family, Urban Single-Family, Attached Housing, Mixed-Use Multifamily, Elementary School, and Office Building. These designs reflect innovative, practical, zero energy solutions in each of these building types. All our students' enthusiasm, creativity, and projects inspire us!

For the Build Challenge, we're super excited to share the progress made to-date on the design and development of fully-functional, attractive, and cost-effective solar powered homes. With our new partnership during the 2020 Smithsonian Folklife Festival, the reach of Solar Decathlon and the innovations of our competing students will be greater than ever before!

The National Renewable Energy Laboratory (NREL) campus is a true example of high-performance building design, situated in the heart of Colorado. The enclosure, lighting design, and unique HVAC features make NREL's Research Support Facility (RSF) and Energy Systems Integration Facility (ESIF) some of the most efficient office and laboratory buildings in the world. The RSF is a zero energy building that gained LEED® Platinum certification upon completion and includes such innovations as the "lazy H" architectural design to maximize daylighting in the office environment. The ESIF contains many state-of-the-art energy integration labs, including the Smart Power Lab, which aims to help the industry understand integration challenges related to smart power electronics on the grid. Tours of the RSF and ESIF, offered on Friday afternoon, are a great way to see these incredible buildings firsthand and hear directly from energy engineers and building science professionals that helped make it a reality.

We want to also welcome our sister student design competition JUMP into STEM, which seeks to engage students in STEM field research and innovation. During Friday afternoon's competition, watch JUMP into STEM student teams compete for summer internship awards at Oak Ridge National Laboratory or NREL.

Design Challenge Weekend is intended to inspire all, and provide you with the preparatory skills required to become a part of this amazing leadership movement to achieve truly sustainable buildings. We are excited to see all the designs and are eager to hear about creative solutions to these real-world problems.

The impressive quality of participating students is noticed by our outstanding sponsors and jurors. We know this from watching the significant growth of interest in engaging students about future job opportunities during our Career Connections session at the end of each competition.

We are so excited you are taking that all-important first step to become part of the zero energy ready buildings movement. Thank you for your commitment to making a difference! We hope this experience changes the way you look at building design and the future of our industry.



**Holly Jamesen Carr**  
U.S. Department  
of Energy, Building  
Technologies Office  
*Solar Decathlon  
Acting Director*



**Sam Rashkin**  
U.S. Department  
of Energy, Building  
Technologies Office  
*Chief Architect and  
Solar Decathlon  
Co-Director*



**Sarah Zaleski**  
U.S. Department  
of Energy, Building  
Technologies Office  
*Senior Advisor and  
Solar Decathlon  
Co-Director*

## DESIGN CHALLENGE JURORS

### GRAND JURORS

**Sheila Hayter, PE**  
*2018-19 ASHRAE President*  
 NREL Senior Research Advisor

**Tim McDonald, RA**  
*CEO*  
 Onion Flats LLC

**Rusty Smith**  
*Associate Director*  
 Auburn University Rural Studio

### SUBURBAN SINGLE-FAMILY

**Diana Fisler**  
*Building Science and Innovation Leader*  
 The Spray Foam Coalition/Johns Manville

**Wayne Kraft**  
*Research Engineer*  
 Ingersoll Rand

**Scott Sanders**  
*CEO*  
 BrightLeaf Homes

**Ray Tonjes**  
*President*  
 Ray Tonjes Builder, Inc./National Associate of Home Builders

### URBAN SINGLE-FAMILY

**Rick Duncan, PE**  
*Technical Director*  
 Spray Polyurethane Foam Alliance

**Laura Dwyer**  
*Global Innovation Leader*  
 The DuPont Building Knowledge Center

**Joe Nebbia**  
*Consultant*  
 Newport Partners LLC

**Tom Tishler**  
*Director of Construction Operations*  
 Kalamazoo Valley Habitat for Humanity

## ATTACHED HOUSING

**Marcus Bianchi, PE**  
*Senior Building Science Program Lead*  
 Owens Corning

**Lance MacNevin, P. Eng.**  
*Director of Engineering – Building & Construction Division*  
 Plastics Pipe Institute

**Gene Myers**  
*CEO*  
 Thrive Builders

**Andrea Traber**  
*Senior Principal*  
 Integral Engineering

## MIXED-USE MULTIFAMILY

**Jaquelin R. Camp**  
*Senior Associate*  
 WRT Design

**Sue McFaddin**  
*President*  
 Seven Generations

**Dave Olson, PE**  
*Vice President*  
 PCD Engineering/ASHRAE

**Cameron Stewart**  
*West Coast Applications Engineer*  
 SolarEdge

## ELEMENTARY SCHOOL

**Calvin Ahn**  
*Associate Principal*  
 Ashley McGraw Architects, D.P.C.

**Shannon Oliver**  
*Manager - Energy & Sustainability*  
 Adams 12 Five Star Schools

**Sean Quinn**  
*Sustainable Design Leader - Performance*  
 HOK

**Alex Warring**  
*Mechanical System Engineer*  
 Affiliated Engineers, Inc.

## OFFICE BUILDING

**Keith Boswell**  
*Technical Partner*  
 SOM

**Dawn De Grazio**  
*Technical Editor*  
 Illuminating Engineering Society

**Kimberly Llewellyn**  
*Manager, Performance Construction*  
 Mitsubishi Electric Cooling & Heating

**Marcin Pazera**  
*Technical Director*  
 Polyisocyanurate Insulation Manufacturers Association

## BUILD CHALLENGE REVIEWERS

**Cedar Blazek**  
*Science, Technology and Policy Fellow*  
 Department of Energy

**Martha Bohm**  
*Assistant Professor*  
 University at Buffalo

**Scott Tjaden**  
*Innovation Technology Specialist*  
 Pepco Holdings

To learn more about our jurors, visit

<https://www.solardecathlon.gov>

## FRIDAY-SUNDAY, APRIL 12-14, 2019

### FRIDAY, APRIL 12 – ACTIVITIES FOR ALL PARTICIPANTS

TIME	ACTIVITY	LOCATION
9:00 a.m.–12.00 p.m.	<b>RECOMMENDED BUT OPTIONAL: Faculty Meeting</b>	RSF X324 Huerfano
12:00 p.m.	<b>Grand Finale JUMP into STEM Competition Event</b>	Marriott Beaver Creek
3:00 p.m.	<b>Team/Staff/Juror Check-In Opens</b>	Café
3:00 p.m.–4.00 p.m.	<b>Exhibit Drop-Off</b>	RSF and Café
4:00 p.m.	<b>Tours of NREL’s Research Support Facility (RSF) and Energy Systems Integration Facility (ESIF)</b>	Meet in Café
6:00 p.m.	<b>Dinner and Welcome</b> Remarks by Solar Decathlon Acting Director Holly Jamesen Carr, and Solar Decathlon Co-Directors Sam Rashkin and Sarah Zaleski Host Sponsor Remarks: SolarEdge West Coast Applications Engineer Cameron Stewart JUMP into STEM Winner Announcement by BTO Technology to Market Manager Mary Hubbard All-Team Interactive Activity with BTO Fellow Michael Specian	Café
8:00 p.m.	<b>Conclude for the day</b>	

### SATURDAY, APRIL 13 – TRACKS FOR DESIGN & BUILD CHALLENGE PARTICIPANTS

TIME	DESIGN CHALLENGE TRACK	LOCATION	BUILD CHALLENGE TRACK	LOCATION
8:00 a.m.	<b>Team/Staff Check-In and Breakfast</b>	Café	<b>Team/Staff Check-In and Breakfast</b>	ESIF
8:00 a.m.	<b>Juror Check-In and Orientation</b>	RSF	<b>Reviewer and Mentor Check-In and Orientation</b>	RSF
8:35 a.m.	<b>Introduction to Division Presentation Day</b>	Café	<b>Introduction to Build Challenge Day</b>	ESIF
9:15 a.m.	<b>Division Presentations</b>	RSF	<b>Team Presentations and Mentorship Breakouts</b>	ESIF
11:30 a.m.	<b>Box Lunch and Keynote</b>	Café	<b>Box Lunch and Keynote</b>	ESIF
1:00 p.m.	<b>Division Presentations</b>	RSF	<b>Team Presentations and Mentorship Breakouts</b>	ESIF
5:00 p.m.	<b>Poster Session with Appetizers</b> Remarks by NREL Buildings & Thermal Sciences Center Director Achilles Karagiozis			Café
5:00 p.m.	<b>Jury Deliberations</b>	RSF	<b>Review Committee Deliberations</b>	ESIF
7:30 p.m.	<b>Film Festival with light food and refreshments</b>			Marriott Keystone & Telluride

# FRIDAY-SUNDAY, APRIL 12-14, 2019

# AGENDA

## SUNDAY, APRIL 14 – ACTIVITIES FOR ALL PARTICIPANTS

TIME	ACTIVITY	LOCATION
7:45 a.m.	<b>Breakfast Buffet</b>	Marriott Foyer
8:15 a.m.	<b>Present Build Challenge Approvals to Proceed and Design Challenge Division Awards</b>	Marriott Ballroom
9:00 a.m.	<b>Thought Leader Speaker</b> Auburn University Rural Studio Associate Director Rusty Smith	Marriott Ballroom
9:30 a.m.	<b>Career Connections</b>	Marriott Foyer
9:30 a.m.	<b>Concurrent Faculty Meeting</b>	Marriott Telluride
11:00 a.m.	<b>Awards Banquet Luncheon and Grand Winner Presentations</b>	Marriott Ballroom
1:30 p.m.	<b>Competition Weekend Conclusion</b>	



Please remember to bring your badge on Saturday and Sunday

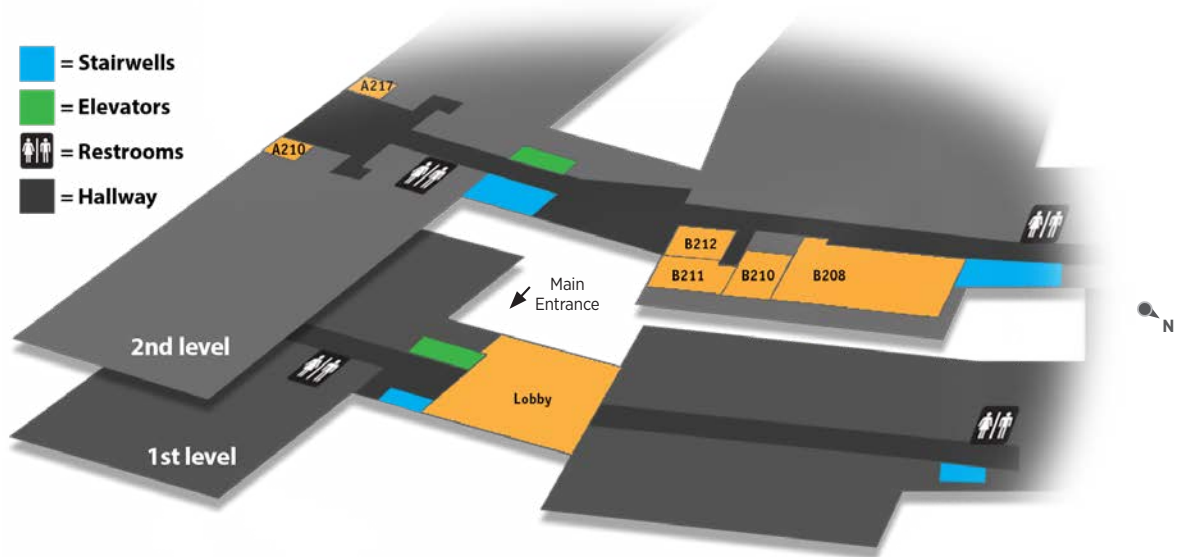
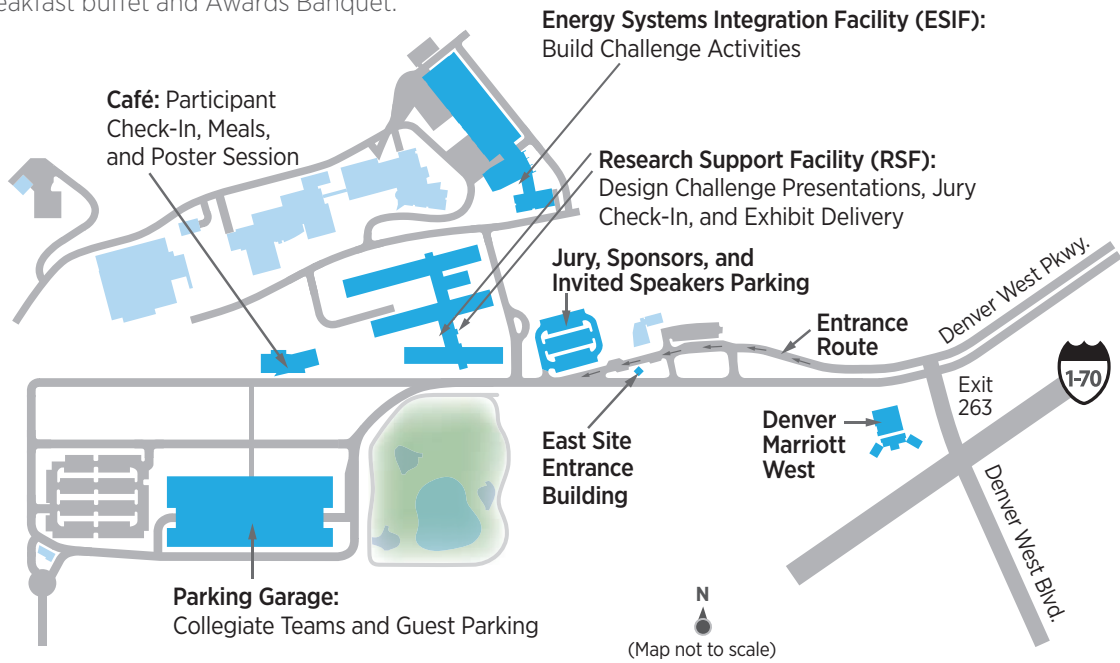
Tag your social media: #SolarDecathlon

## WI-FI ACCESS

The **NREL-Guest** wireless network is provided to NREL's visitors for Internet access. Accept the terms of the acceptable use policy to gain access.

## NREL CAMPUS

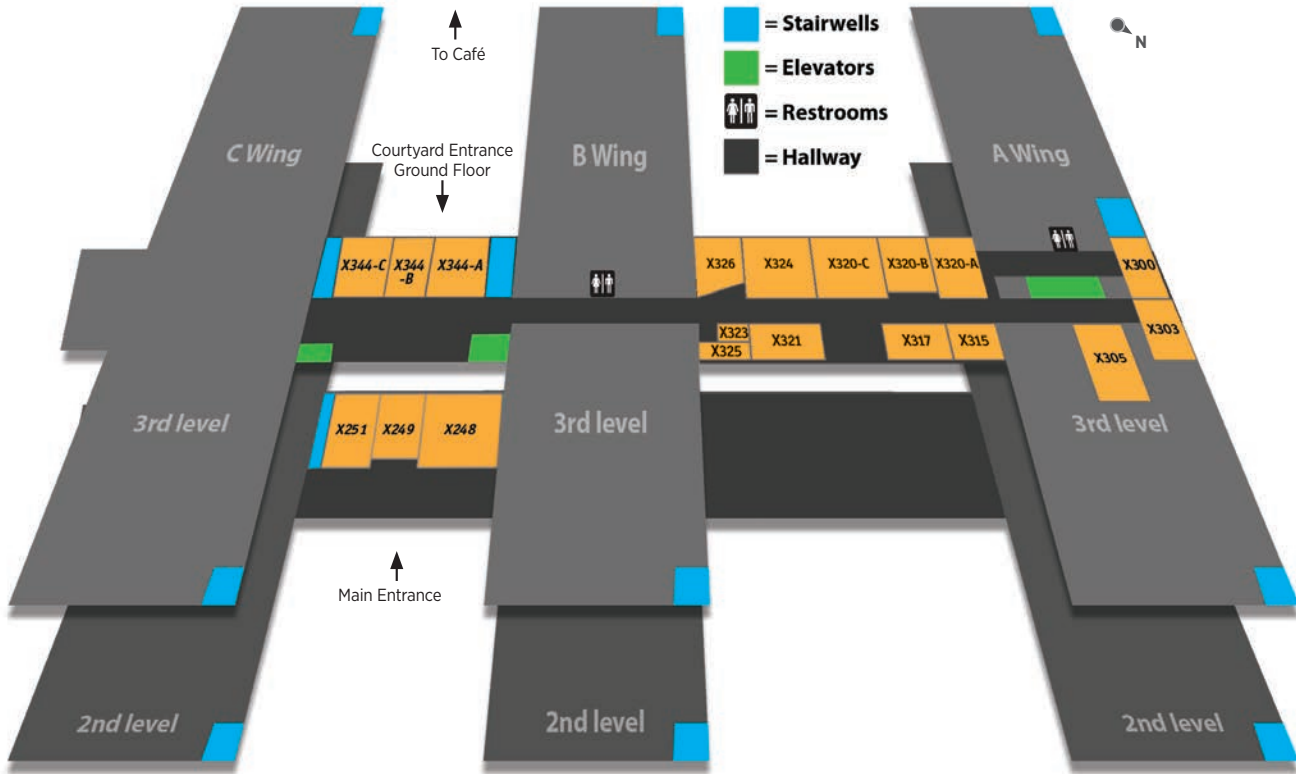
Note: All participants for the Design Challenge Weekend must present their event badges to gain entrance to the NREL facilities and to attend the events at the Denver Marriott West, including the breakfast buffet and Awards Banquet.



## ENERGY SYSTEMS INTEGRATION FACILITY (ESIF)

ESIF - 1ST FLOOR LOBBY: Check-In  
 ESIF - 2ND FLOOR HALLWAY: Food & Refreshments  
 ESIF - A210 WILLOW: Sponsorship  
 ESIF - A217 COTTONWOOD: Communications

ESIF - B208 MAXWELL: Presentations  
 ESIF - B210 TESLA: Competition Management  
 ESIF - B211 EDISON: Building Code  
 ESIF - B212 FARADAY: Instrumentation



**RESEARCH SUPPORT FACILITY (RSF)**

**Division Presentation Rooms:**

- RSF - X248 RIO BLANCO: Elementary School
- RSF - X251 ROARING FORK: Office Building
- RSF - X320-B and C BEAVER CREEK: Urban Single-Family
- RSF - X344-A SAN JUAN: Suburban Single-Family
- RSF - X344-B SAN JUAN: Attached Housing
- RSF - X344-C SAN JUAN: Mixed-Use Multifamily

**Division Practice Rooms:**

- RSF - X249 RIO GRANDE: Elementary School
- RSF - X300 ALAMOSA: Suburban Single-Family
- RSF - X303 ANIMAS: Urban Single-Family
- RSF - X305 BEAR CREEK: Attached Housing
- RSF - X315 BIG THOMPSON: Mixed-Use Multifamily
- RSF - X317 VIBE: Office Building

**Other:**

- RSF - X320-A BEAVER CREEK: Scale Models
- RSF - X321 COLLABORATION: Organizer Headquarters
- RSF - X323 LITTLE SNAKE: Available on Demand
- RSF - X324 HUERFANO: Jurors and Friday Faculty Meeting
- RSF - X325 MANCOS: Available on Demand
- RSF - X326 GUNNISON: Organizer Headquarters



SATURDAY, APRIL 13, DIVISION PRESENTATIONS

Time (MDT)	Agenda Item & Location						
8:00 a.m. – 8:35 a.m.	Team/Staff Check-In and Breakfast - Café. If you checked in on Friday, you must bring your badge to enter the facility.						
8:35 a.m. – 9:00 a.m.	Introduction to Day with remarks by Solar Decathlon Co-Director Sarah Zaleski - Café						
9:00 a.m. – 9:15 a.m.	Introduction to Division Presentations and Jurors - RSF						
	<b>Suburban Single-Family</b> Room X344-A San Juan	<b>Urban Single-Family</b> Room X320-B and C Beaver Creek	<b>Attached Housing</b> Room X344-B San Juan	<b>Mixed-Use Multifamily</b> Room X344-C San Juan	<b>Elementary School</b> Room X248 Rio Blanco	<b>Office Building</b> Room X251 Roaring Fork	
9:15 a.m. - 9:55 a.m.	The Pennsylvania State University <i>NGBS</i>	Georgia Institute of Technology <i>Grove Park Yellow Jackets</i>	Appalachian State University <i>Bridging LIFE</i>	Technische Universität Berlin - EUREF Campus <i>Team Encobe CG</i>	King Fahd University of Petroleum and Minerals <i>Team KFUPM</i>	Virginia Polytechnic Institute and State University <i>E<sup>2</sup>CO.re</i>	
10:00 a.m. - 10:40 a.m.	United States Military Academy at West Point <i>USMA Green</i>	Jefferson University <i>RM-C</i>	University of Minnesota Twin Cities <i>UMN Transformers</i>	State University of New York College of Environmental Science and Forestry and Syracuse University <i>Syracuse Energy Efficient Design</i>	Illinois Institute of Technology <i>LESA</i>	The University of Arizona <i>SUNBLOCK co-op</i>	
10:45 a.m. - 11:25 a.m.	Appalachian State University <i>VIABLE HABITS</i>	Ball State University <i>CONTEXT CONSERVATION CONSTRUCTION</i>	The University of Texas at Austin <i>SOL Tex</i>	University of Missouri-Columbia <i>SUNsational</i>	Yale University <i>Yale Team</i>	Indiana University-Purdue University Indianapolis <i>Ut Viride</i>	
11:30 a.m. - 1:00 p.m.	Lunch with remarks by Solar Decathlon Co-Director Sam Rashkin Host sponsor remarks: Ingersoll Rand Vice President Rasha Hasaneen Keynote panel: DOE Acting Program Manager Joan Glickman; ASHRAE President Sheila Hayter; and Onion Flats CEO Tim McDonald.						
1:00 p.m. - 1:40 p.m.	Michigan State University <i>Go Green Team</i>	The University of Texas at Austin <i>TEXSun</i>	Virginia Polytechnic Institute and State University <i>Eco1Ogic</i>	University of Illinois at Urbana-Champaign <i>ILLennials</i>	University of Portland <i>Team Pilot</i>	Jefferson University <i>SHR</i>	
1:45 p.m. - 2:25 p.m.	The University of Arizona <i>SUNBLOCK retrotechs</i>	University of Wisconsin-Madison and University of Wisconsin-Milwaukee <i>Urban Innovators</i>	The Manchester School of Architecture <i>18C.MSA</i>	Ball State University <i>BSU HP2</i>	Miami University <i>Team Red Hot Chili Bs</i>	Western New England University and Technological University of Panama <i>PANAMASS 2</i>	
2:30 p.m. - 3:10 p.m.	Eastern Michigan University <i>Eastern Michigan Eagles</i>	Carnegie Mellon University <i>Urban Design Build Studio (UDBS)</i>	Washington University in St. Louis <i>Team WashU - St. Louis</i>	CEPT University <i>Kill Bill Vol3</i>	Universidade Federal do Paraná <i>PARANÁ TEAM</i>	California State University, Fullerton <i>Builders of Eos</i>	
3:15 p.m. – 3:30 p.m.	BREAK - Refreshments served in the RSF 3rd Floor Hallway						
3:30 p.m. - 4:10 p.m.	West Virginia University <i>ASH (Appalachian Sustainable Housing)</i>	Hampton University <i>Millennial Village</i>	Miami University <i>The New Ruralists</i>	Illinois Institute of Technology <i>Bron-Zero</i>	The University of Arizona <i>SUNBLOCK Primary</i>	<i>No presentation</i>	
4:15 p.m. - 4:55 p.m.	<i>No presentation</i>	Kansas State University <i>Green Collective</i>	University of Missouri-Columbia <i>Super Energy Bros.</i>	Jefferson University <i>MERGE</i>	University of Cincinnati <i>[re]form-ED</i>	<i>No presentation</i>	



## SATURDAY, APRIL 13, PRESENTATIONS

Time (MDT)	Agenda Item & Location					
8:00 a.m. - 8:45 a.m.	Check-In & Breakfast - ESIF. Bring your badge. If you have not received a badge, check-in at the Café first.					
8:45 a.m. - 8:50 a.m.	Welcome and Schedule Overview - ESIF B-208 Maxwell, with remarks by Build Challenge Competition Manager Joe Simon					
8:50 a.m. - 9:15 a.m.	DOE Welcome Plenary & Remarks - ESIF B-208, with remarks by Solar Decathlon Acting Director Holly Carr					
	Presentations Room B-208 Maxwell	Competition Management Room B-210 Tesla	Building Code Room B-211 Edison	Instrumentation Room B-212 Faraday	Sponsorship Room A-210 Willow	Communications Room A-217 Cottonwood
9:15 a.m. - 9:45 a.m.	Las Vegas	U of Denver	CU Boulder	Missouri S&T	Waterloo	Weber State
9:45 a.m. - 10:15 a.m.	South Africa	CU Boulder	Missouri S&T	Waterloo	Weber State	U of Denver
10:15 a.m. - 10:45 a.m.	Chile	Missouri S&T	Waterloo	Weber State	U of Denver	CU Boulder
10:45 a.m. - 11:00 a.m.	BREAK - Refreshments served in the ESIF 2 <sup>nd</sup> Floor Hallway					
11:00 a.m. - 11:30 a.m.	Kansas State	Waterloo	Weber State	U of Denver	CU Boulder	Missouri S&T
11:30 a.m. - 12:00 p.m.	Netherlands	Weber State	U of Denver	CU Boulder	Missouri S&T	Waterloo
12:00 p.m. - 1:15 p.m.	LUNCH - Keynote by Richard King, Solar Decathlon Founder and Smithsonian Folklife Festival Staff					
1:15 p.m. - 1:45 p.m.	Illinois	Las Vegas	South Africa	Chile	Kansas State	Netherlands
1:45 p.m. - 2:15 p.m.	U of Denver	South Africa	Chile	Kansas State	Netherlands	Illinois
2:15 p.m. - 2:45 p.m.	CU Boulder	Chile	Kansas State	Netherlands	Illinois	Las Vegas
2:45 p.m. - 3:00 p.m.	BREAK - Refreshments served in the ESIF 2 <sup>nd</sup> Floor Hallway					
3:00 p.m. - 3:30 p.m.	Missouri S&T	Kansas State	Netherlands	Illinois	Las Vegas	South Africa
3:30 p.m. - 4:00 p.m.	Waterloo	Netherlands	Illinois	Las Vegas	South Africa	Chile
4:00 p.m. - 4:30 p.m.	Weber State	Illinois	Las Vegas	South Africa	Chile	Kansas State
4:30 p.m. - 4:55 p.m.	Close-out, Questions, and Discussion - ESIF Maxwell B-308, with remarks by Solar Decathlon Acting Director Holly Carr					

# DESIGN CHALLENGE TEAMS

Collegiate Institution	Location	Division	Team	Project Name
Appalachian State University	Boone, NC	SSF	VIABLE HABITS	Catalog Home
		AH	BRIDGING LIFE	LIFEmpowered
Ball State University	Muncie, IN	USF	CONTEXT CONSERVATION CONSTRUCTION	Muncie Habitat for Humanity
		MM	BSU HP2	WILMORE 424
California State University, Fullerton	Fullerton, CA	OB	Builders of Eos	Apollo Aftosynth
Carnegie Mellon University	Pittsburgh, PA	USF	Urban Design Build Studio (UDBS)	RE_CON 01
CEPT University	Ahmedabad, India	MM	Kill Bill Vol3	Affordable Housing
Eastern Michigan University	Ypsilani, MI	SSF	Eastern Michigan Eagles	Natura I -E3 - House
Georgia Institute of Technology	Atlanta, GA	USF	Grove Park Yellow Jackets	Cottages at Hasty Place
Hampton University	Hampton, VA	USF	Millennial Village	The Millennial Container Village
Illinois Institute of Technology	Chicago, IL	ES	LESA	Legend Elementary School of the Arts
		MM	Team Bron-Zero	the Network
Indiana University-Purdue University Indianapolis	Indianapolis, IN	OB	Ut Viride	Modern Sustainable Offices
Jefferson University	Philadelphia, PA	USF	RM-C	MOD-1
		MM	MERGE	Regenerating Sharswood
		OB	SHR	GEODE
Kansas State University	Manhattan, KS	USF	Green Collective	Woodland Abode
King Fahd University of Petroleum and Minerals	Dhahran, Saudi Arabia	ES	Team KFUPM	BEDAYIAH (Beginning)
Miami University	Oxford, OH	ES	Team Red Hot Chili Bs	Sowing Seeds Academy
		AH	The New Ruralists	Harvest Village
Michigan State University	East Lansing, MI	SSF	Go Green Team	Sunny Side Suburbs
State University of New York College of Environmental Science and Forestry	Syracuse, NY	MM	Syracuse Energy Efficiency Design team (Syracuse Energy)	SEED
Technische Universität Berlin - EUREF Campus	Berlin, Germany	MM	Team Encobe CG	hybx berlin
The Manchester School of Architecture	Manchester, United Kingdom	AH	18C.MSA	El Santuario
The Pennsylvania State University	University Park, PA	SSF	NGBS	Next Generation Building Solutions II The Habitat Home
The University of Arizona	Tuscon, AZ	SSF	SUNBLOCK retrotechs	Casa Nueva
		OB	SUNBLOCK co-op	Co-Working Space + Community Commercial Kitchen
		ES	Sunblock Primary	Saguaro Primary
The University of Texas at Austin	Austin, TX	AH	SOLTex	Blackland Neighborhood Rowhouses
		USF	TEXSun	Alley Flat
United States Military Academy at West Point	West Point, NY	SSF	USMA Green	All American Abode
Universidade Federal do Paraná	Curitiba, Brazil	ES	Paraná Team	PIRAQUARA SCHOOL
University of Cincinnati	Cincinnati, OH	ES	[re]form-ED	Walnut Hills Elementary School
University of Illinois at Urbana-Champaign	Urbana, IL	MM	ILLennials	ARC (Architecture, Resilience & Community)
University of Minnesota Twin Cities	St. Paul, MN	AH	UMN Transformers	eMpower Pocket Neighborhood
University of Missouri-Columbia	Columbia, MO	MM	SUNsational	Park Avenue Apartments
		AH	Super Energy Bros.	Park Avenue Townhomes
University of Portland	Portland, OR	ES	Team Pilot	Rose City Elementary
University of Wisconsin-Madison	Madison, WI	USF	Urban Innovators	DOMUS SOLIS "Solar House"
Virginia Polytechnic Institute and State University	Blacksburg, VA	OB	E <sup>2</sup> CO.re	ECO-GraphiO
		AH	Eco10gic	TreeHAUS
Washington University in St. Louis	St. Louis, MO	AH	Team WashU - St. Louis	STL Connected
West Virginia University	Morgantown, WV	SSF	ASH (Appalachian Sustainable Housing)	Ember
Western New England University	Springfield, MA	OB	PANAMASS 2	Western New England Incubator Building
Yale University	New Haven, CT	ES	Yale Team	escuela cero

AH	ES	MM	OB	SSF	USF
Attached Housing	Elementary School	Mixed-Use Multifamily	Office Building	Suburban Single-Family	Urban Single-Family

Collegiate Institution	Location	Team
Hogeschool Utrecht University of Applied Sciences Utrecht	Utrecht, Netherlands	Solar Decathlon Team HU
Kansas State University	Manhattan, Kansas	Net Positive Studio
Missouri University of Science and Technology	Rolla, Missouri	Missouri S&T Solar House Design Team
Universidad Técnica Federico Santa María	Valparaíso, UTFSM	ValSust
University of Colorado, Boulder	Boulder, Colorado	CU Boulder Build
University of Denver	Denver, Colorado	University of Denver
University of Illinois at Urbana-Champaign	Urbana, Illinois	Adapthaus
University of Nevada, Las Vegas	Las Vegas, Nevada	Team Las Vegas
University of the Witwatersrand, Johannesburg	Johannesburg, South Africa	Manqoba
University of Waterloo	Waterloo, Ontario	Warrior Home
Weber State University	Ogden, Utah	Solar Decathcats



### JUMP into STEM

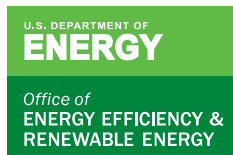
JUMP into STEM is an online student competition hosted by Oak Ridge National Laboratory (ORNL) and the National Renewable Energy Laboratory (NREL), designed to motivate student engagement in STEM and buildings industry related research and innovation. JUMP into STEM hosted three Challenges during the Fall 2018 and Winter 2019 terms, selecting top teams to compete in the Grand Finale JUMP into STEM Competition Event. Winner awards are placement in paid 10-week Summer 2019 internships at ORNL or NREL. The internship awards are designed to promote an enhanced training environment for the next generation of scientists, architects, and engineers by exposing them to research challenges unique to the building industry. Visit [jump.ideascale.com](http://jump.ideascale.com) for more information.

Collegiate Institution	Location	Team	Challenge Category
Georgia Institute of Technology	Atlanta, GA	Randomized Encouragement Design: Behavioral Incentives on Older Adults to Reduce Energy Consumption	Using the Right Data at the Right Time
Georgia Institute of Technology	Atlanta, GA	Home Energy Score Interactive Dashboard	Using the Right Data at the Right Time
University of Colorado Boulder	Boulder, CO	Retrofitted Wall	Pushing the Envelope with Wall Retrofit Designs
University of Colorado Boulder	Boulder, CO	Automated Design Generation for Pre-manufactured Insulated Panel Wall Retrofit System	Pushing the Envelope with Wall Retrofit Designs
University of Tennessee Knoxville	Knoxville, TN	AutoStat	Using the Right Data at the Right Time

HOST SPONSORSHIP



EDUCATION SPONSORSHIP



Prepared by the National Renewable Energy Laboratory (NREL)  
NREL is a national laboratory of the U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
Operated by the Alliance for Sustainable Energy, LLC

Photos by NREL and the Collegiate Teams of the Solar Decathlon

For more information, visit: [energy.gov/eere](http://energy.gov/eere)

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