# **Collective Comfort II: A Public Program for Heat Resilience**

Meetings: Mondays & Wednesdays, 2pm – 6pm Faculty: Liz Gálvez, Assistant Professor of Architecture (below): The possibilities of new thermal regimes defined by new architectural environments and collectives.

ARCH 202 | Spring 2024



The Weather Project, 2003 - Olafur Eliason.



Cité Climatisée, from Air Architecture, 1961, Yves Klein. Drawing for a city protected by a wall of air and inhabitants welcoming an immaterial world.

"I did not stop to really think; I only felt, and my only feeling was a desire to get cool and to get out of the Territory in some other way and at some cooler season. How futile a wish, and how futile a vow!"

-Martha Summerhayes, Vanished Arizona

## **INTRODUCTION:**

American desert cities designed and built at the turn of the century, in collaboration with the advent of air-conditioning technologies, have been able to house millions of Americans by relying primarily on fossil-fuels to supply relief from extreme hot weather. The Phoenix Metro Area, or The Valley of The Sun as it is known to locals, experienced 145 days reaching temperatures over 100°F in 2020 according to the National Weather Service. In July of 2023, Phoenix set a new record with 31 days strait of over 110-degree heat. The increased probability of a longer-lasting heat-wave, combined with the over demand of electrical power supply during extreme weather events can be catastrophic, especially to the most vulnerable populations. Today, municipal government, local communities, and grass roots organizations, coupled with environmental researchers in the Phoenix Metro Area have taken note of the risks that heat poses to human livelihoods and are working to develop cooling centers as strategy to deal with heat insecurity.

To address equitable-cooling in relationship with an over-reliance on private mechanical, electrically powered air-conditioning technologies, the Collective Comfort course sequence aims to develop a public program that re-thinks the cooling center as an educational climate resilience hub. Furthermore, Collective Comfort aims to bring education on heat risk and weatherization efforts to the forefront, helping to destabilize the fossil-fuel reliant single-family home by providing alternative visions that foreground collectivity and community resilience in desert cities.

Students will collectively develop design principles, ideas and strategies that can inform the cooling center as a heat resilience and climate education hub. This year-long interdisciplinary endeavor proposes a research seminar (Fall 2023) followed by an advanced collaborative architecture studio (Spring 2024). The sequence brings interdisciplinary partners from resiliency planning, engineering, and community stakeholders into collaboration with architecture students to imagine architectures that bring the discussion on comfort to the forefront. Through the lens of the collective the course aims to advance social infrastructures that can imagine not only surviving extreme weather, but reframing comfort discourse from mechanical efficiency towards renewed thermal engagement in our architectures to come.

The resilience hub design guidelines developed in the seminar will support a replicable framework for new construction and adaptive reuse. The framework will address urban site selection in relation to the community needs, basic list of proposed programs and strategies to identify culturally appropriate program needs, design strategies, energy systems, materials and construction methods. These guidelines and framework documents will serve our community partners and stakeholders as they develop the Phoenix Metro area "resilience hub necklace."

## UC Berkeley | Dept. of Architecture



Site 1: The Palo Verde Library and Maryvale Community Center simultaneously a Cooling Center.

## **PROJECT PARTNERS:**

**Dalia Munenzon** is an assistant professor of urban design at the University of Houston's Gerald D. Hines College of Architecture and Design, where she focuses on researching and teaching adaptive strategies and resiliency methods for sustainable communities and infrastructure.

**Melissa Guardaro** is an assistant research professor in the Julie Ann Wrigley Global institute of Sustainability at Arizona State University and works for the Healthy Urban Environments Initiative (HUE) and Knowledge Exchange for Resilience (KER). Her research focuses on adaptation, equity, vulnerability, urban policy, and governance for the mitigation and adaptation to extreme heat and urban heat island effects. She is currently working with the City of Phoenix to formulate a comprehensive heat reduction strategy, and with The Nature Conservancy, the Maricopa County Health Department, and community-based organizations to create neighborhood heat solutions that improve thermal comfort and public health outcomes, especially during extreme heat events.

**Salmaan Craig** is an Assistant Professor at the School of Architecture, McGill University. He works on developing new technologies and materials that will one day replace mechanical air-conditioning He researches how to turn biogenic building materials into heat-exchangers. Site 1: (above left) The Palo Verde Library and Maryvale Community Center, currently utilizes as a Cooling Center as a secondary use. The site is run by the Phoenix Public Library, the most extensive owner of Cooling Centers in the city and is located in the predominantly Latino Neighborhood on the West Side.

Site 2: (above right) The Wesley Resiliency Center is run by the Arizona faith Alliance in the South of Phoenix, serving a predominantly African American community. The center is the first of its kind and opened in Summer 2023. Additional architectural visioning could help this client secure funding to continue to develop this center's architectural character and potential to serve as a social infrastructure.

# **READING LIST:**

## Air Conditioning and Buildings

- Banham, Reyner. "A Home is Not a House," in Art in America #2. 1965. Olgyay, Victor, Design with Climate:
- Bioclimatic Approach to Architectural Regionalism, 2015. Srdjan Jovanovic Weiss, "Better Than
- Weather: The Austin Air-Conditioned Village," Cabinet Magazine, 200
- Cooper, Gail. Air-Conditioning America: Engineers and the Controlled Environment, 1900–1960, 1998.
- Barber, Daniel A. Modern Architecture and Climate: Design before Air Conditioning, 2020.

## **Heat in Phoenix**

- M. Guardaro, D.M. Hondula, Adaptive capacity to extreme urban heat: The dynamics of differing narratives, Climate Risk Management, Volume 35, 2022.
- Wallace-Wells, David. "Heat Death," in The Uninhabitable Earth. New York: Tim Diggan Books, 2019.
- Brian Stone Jr., et al. "How Blackouts during Heat Waves Amplify Mortality and Morbidity Risk", in Environmental Science & Technology 2023
- Center for Whole Communities & The Nature Conservancy. Greater Phoenix Heat Action Planning Guide: For Neighborhoods of Greater Phoenix, 2019.





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Drawn Air, Yun Koo (M.Arch)

### **COURSE STRUCTURE:**

1. Warming Air,

- 2. Collective Air,
- 3. Imagining Air, and
- 4. Drawing Air.

During 'Warming Air,' students will begin to explore cooling techniques and building through precedent research and exploration into a series of techno-environmental objects relevant to the desert context. During this phase, students will simultaneously welcome experts and community leaders who are working in Phoenix, Arizona on efforts towards heat resilience. The second phase, 'Collective Air,' will ask students to develop new collective programs and habits. Once the seminar has identified the key comfort and collectivity opportunities, we will 'Imagine Air' or design concepts that engage two prototypical architectural and site conditions towards the definition of a collective comfort hub. While we will be working on the conceptual framework for architecture in the third phase of the seminar, during the fourth and final phase of the seminar we will move into documenting these ideas as building proposals through the 'Drawing Air' exercise.





Conditioning Rejected Air, Alec Burran (M.Arch)

Of Doors, of Air, Michelle Schneider (M.Arch)

#### **COURSE OBJECTIVES**

- To facilitate discourse that bridges between building science, architectural and social design to develop forward-looking environmentalism that expand creative thinking with the technical-cultural aspects of building.
- To examine Collective Comfort as an interdisciplinary design solution that can address energy-insecurity in air-conditioning dependent communities.
- To facilitate interdisciplinary visualization of heat-risk and energy insecurity in air-conditioning dependent communities.
- To support and inform existing community efforts that address heat insecurity and climate change though architectural representation.
- To develop an enriching programmatic and performative outline for the Cooling Center as a resiliency hub for desert-cities.

Student samples from the Drawing Air studio, previously taught at Rice Architecture in the Fall of 2020.

#### **Urban Heat and Equitable Planning**

- Klinenberg, Eric. Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life, 2018.
- Munenzon D. The Urban Commons as a Remedy to Climate Change Vulnerabilities.
- Amorim-Maia, "Seeking Refuge? The Potential of Urban Climate Shelters to Address Intersecting Vulnerabilities."

#### **Collectivity and Comfort**

- Heschong Lisa. Thermal Delight in Architecture. MIT Press 1979.
- Barber, Daniel A. "After Comfort." Log 47 (2019): 45-50.
- Klein, Yves and Werner Ruhnau, "Project for an Air Architecture".
- Gálvez, Liz. "From Exigent to Adaptive." Footprint, Vol. 13 No. 2, Issue 25 (Autumn/ Winter 2019): 101-118.
- Canguilhem, Georges. "The Living and Its Milieu [1951]." Grey Room, 6–31.
- ASHRAE Standard 55-2020: Thermal Environmental Conditions for Human Occupancy.

#### **Environmental Management**

- Banham, Reyner, The Architecture of the Well-Tempered Environment.
- Salmaan Craig, Cascading temperature demand: The limits of thermal nesting in naturally ventilated buildings, Building and Environment, 2022.
- Murphy, Michelle. "Man in a Box: Building Machines and the Science of Comfort," in Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers, 2006.
- Moe, Kiel. Thermally Active Surfaces in Architecture, 2010.
- Short, C. Alan. 2017. The recovery of natural environments in architecture: air, comfort and climate

#### **Environment and Material**

- Watson, Julia, Lo-TEK: Design by Radical Indigenism. Italy: Taschen, 2019.
  Hutton, Jane, Reciprocal Landscapes:
- Stories of Material Movements, 2019.
- Kennedy, Sheila, Material Misuse, 2001.
- Dunning, Jeanne. "Thoughts on Dirt: Walter De Maria's The New York Earth Room and Robert Smithson's Partially Buried Woodshed", 2017).
- Meredith Miller, "Welcome to the Plastisphere." In Climates: Architecture and the Planetary Imaginary, 2016.