

# An Interior Complex

Roles of complexity in architecture are rapidly shifting beyond emergent, elegant and intricate objects to complex relationships of parts. The implications expand the architectural vocabulary to include a new band of connections to manage and address volumetric, social, programmatic and environmental issues. For much of the last two decades, complexity has been spent on generative surfaces, flush with continuity and resolution. A shift to generative volume offers productive interiors the opportunity to actively participate in ousting the strict duality that has developed between outside and inside. This paper will argue for the role of interior volume in relationship to exterior complexity.

The story of the interior reveals and provokes the spectacular and complex. Historically, the relationship between volumetric interiors and the exterior massing has ranged from periods of literal offsets in geometry to fantastic sectional differences. An interior complex argues for the relevance of a specific form of complexity that underscores the handling of volumetric parts (rooms) as an architectural medium, the revival of distinct transitions through calibrated resolution (challenging the smooth), and the expansion of topological boundaries of interior and exterior—exploiting the spatial potential of contemporary *poché*.

The current role of complexity in architecture may have a complex, but it is more than adequate to transcend its somewhat singular association with the digital envelope and expand to meet contemporary challenges of the interior. Navigating this polarity, between a complex exterior and a generic interior, will transform the robust potential of complexity, impacting the physical characteristics of the repetitive qualities of everyday interiors while making the complex more accessible, low-resolution, and relevant. Interiors inflate and deflate over time. Aspects of this were illustrated in the Elements show within the 2014 Venice Biennale. The role of shafts, cavities, plenums and raised floors track this over time. Reestablishing an interior complex that engages volume is a novel trajectory for complexity.

The trend of architects to relinquish their expertise and settle for surface treatment and exterior designing, needs to be amended in order to transition our aptitude for complexity to spatial and volumetric development. The discipline is primed for this expansion as architecture is projected to need more responsive

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environments and computational rigor to meet the demand for efficient, optimized and coordinated systems. Multiple factors, including the need to service the bottom line has instigated a trend towards the environmental scaling down and the apologetic sucking in, often at the expense of the volumetric interior. The aesthetic belt-tightening of our profession leaves the discipline at risk of becoming emaciated. Architecture is obsessed with technical performance to manage climate and energy concerns, yet this alone is not a sufficient design driver. Volume on the other hand is not only sufficient but provocative, and, most importantly, enfold, subsumes and drives technical performance. Contemporary software, such as Building Information Modeling (BIM), thermodynamic modeling, and finite element analysis programs promise optimized differentiation capable of managing complexity beyond the surface to include the volumetric interior. Marrying the ambition of interior complexity with strategies of efficiency, often facilitated through technology, offers an alternative trajectory for the discipline.

### **VOLUMETRIC PARTS**

The exterior of a building is often perceived as a unified whole. It can be captured as an image and is easily comprehended as an object. An interior on the other hand is comprised of objects or rooms interacting in space that require nuanced negotiation and engage perceptual complexity. Developing techniques for utilizing surface distortions, performative *poché* and transforming parts from objects to volumes sets up new architectural tactics for part to part relationships. A focus on the dynamics of the sequencing of volumes, choreographed junctures, and orchestration of a spectacle enables a collective objective to imagine and represent with precision and dexterity the depth and detail of the three-dimensional form. This call for a complex composition of connected parts expands the argument for elegance, intricacy, and parametric relationships to include a new vocabulary capable of defining the relationships of volume.

A spatial vocabulary is developing to meet contemporary needs. A compelling example, is the word *poché*. Originally used to describe the thicken zones of a building—walls and columns—the term now loosely references the space between two surfaces. The new understanding of the term has spawned pairings with architectural words such as performance, thickness and program that further illicit its volumetric potential. Programmed *poché*, as illustrated in Louis Kahn's Unitarian Church Rochester (plan) or Salk Institute (section), decisively uses layered volumes to define spatial hierarchy.<sup>1</sup> The repurposing of vocabulary has often been employed to describe and develop productive relationships. Consider Robert Venturi's architectural definition of crowded intricacies. The term aides make connections as he describes Villa Savoye's rooms as parts and Mannerist painting compositions as elements, both "crowded intricacies within a rigid frame."<sup>2</sup> A distinct pressure is created at the edges. The architectural technique historically created redundant enclosures and grew from the inside out. Again, the return to *poché* offers opportunities for integrating difference, incorporating technology—atmospheric and structural—and productively mediating between inside and outside. A new spatial vocabulary shifts the compositional relationship of parts. In relation to surface *poché*, what is the potential of the internal *brise soleil*?

A brief look at the historic role of composition illustrates the interdependent relationship of tectonics and atmosphere. Elias Cornell defines the exterior as being designed for preparation, introduction, presentation and arousing expectancy, while the interior is meant for fundamental uses and experience.<sup>3</sup> Tectonic

elements are defined by aspects that are primarily constructive (columns, skeleton, structure), while stereotomic elements are meant to facilitate the description of something soaring, suspended, floating, hollowed out, distance-less, with little constructive articulation. The Pantheon is a classic example of parts assembled decisively to connect the interior and exterior. The atrium before the entrance (now Piazza della Rotonda), collects arriving visitors from the irregular streets and assembles them expectantly before the lofty entrance portico. The portico provides a tectonic introduction to the stereotomic interior. The interior suppresses all possible parts under the absolute unity of the whole, generating an awe-inspiring experience. While the Pantheon serves to define the differences between these terms it also displays the complex relationship between them.

In 1901, Alois Reigl identified historical instances in art and architecture of the apprehension of space in the publication *Late Roman Art Industry*. He formalized the concept of objects within space (deep space), and defined the differences between the tactile plane and the optical plane. Reigl recognized that the intuitive understanding of space allows one to pass judgment without complete comprehension. In Reigl's analysis of the Pantheon, he states that the Pantheon is "the oldest preserved, entirely enclosed, interior space of truly significant dimensions with obvious artist intentions".<sup>4</sup> The analysis identifies moments in the Pantheon where the beholder is offered opportunities to shape his own idea of space as the planes alter and niches flicker (references ancient motionless effect). "Everything in the Pantheon is directed towards the awareness of the material limitation of space".<sup>5</sup> This development between the ambition to define the borders of space (enclosure) and to create space emerged during Antiquity. There is an important distinction that is made between shape, depth and plane. This is a relevant transfer of spatial tactics that sets up a significant contribution to perceptual complexity.

Today, the notion of architectural elements and thresholds extending introductions between inside and outside is absent. There is a polarity, often intentional, between the ambition of the exterior and the generic interior. This has provoked a scattering of questions, including the 2008 issue of *Harvard Design Magazine* that asked "What About the Inside?" addressing the state of interiors.<sup>6</sup> Followed by the issue "Architecture's Core?" In 2012, Sylvia Lavin asked, "How do you ask volume back inside after modernism ushered it out?" She refers to the interior as architecture's guilty pleasure, one of its last and best kept secrets: "In short, they have not been disciplined."<sup>7</sup> This a provocative invitation. Preston Scott Cohen addresses issues of the spatial interior in the article *The Hidden Core of Architecture*. "Architecture is now irrevocably split into two different temporalities: the temporariness of interiors and facades and the relative permanence of the basic structure."<sup>8</sup> Cohen claims that only architecture that transforms the "hidden core," defined as the basic structure—frame, slab, elevator, air shaft—will permanently impact architectural space. The temporary will be "scooped out or scrapped off."<sup>9</sup> The new arrangement of stuff is also discussed in binary terms by Wes Jones as he notes that as digital technology develops there is a shift away from aggregatory tectonics. "Today, architecture can be divided up between projects that are made up of assembled discrete parts and projects that are embodied in a continuous, homogenous, or smoothly transitioning (continuously differentiated) mass."<sup>10</sup> Complexity can negotiate these splits as conventional architectural parts such as room, floor, column, wall, and window are used to design spatial relationships between inside and outside and from top to

bottom. The RV (Room Vehicle) Prototype by Greg Lynn is a radical rethinking of interior relationships. It integrates intelligent movement and compact living as an alternative to over-inflated McMansions.<sup>11</sup> Technology has afforded developments in engineering, electronics and materials that guarantee the redefinition of these elements and their complex contributions to the functional capacity of our environment.

#### **TYPOLOGICAL MATCH**

The architectural atrium, a volumetric figure confined within the bounds of architectural facades, offers a critical lens for major developments in interiors and their role in culture. The atrium has transformative qualities. It has the potential to incite controversy and wrestle typologies all while inspiring technological ingenuity. Interior atriums are prominent grounds for an architectural layering of parts. This is an architectural typology where volumetric complexity is amplified. It exerts pressure on typology, not through the polite modification proposed by technical refinement but through spatial and programmatic confrontation. It challenges expectations and inherently insists on a complex set of three dimensional relationships.

A surprising project that exemplifies programmatic complexity and blurs tectonic and stereotomic ambitions is the spectacular monstrosity that is the James R. Thompson Center (originally the State of Illinois Center, renamed in 1992) in downtown Chicago. It was designed by the Chicago-based Murphy/Jahn Architects and completed in 1984. The project incited controversy, advanced building technology and developed a new typology. The exterior provokes with a banded curvilinear massing that contradicts its block-filling neighbors. In a city that popularized the flat black modernist facades, Mark Caro of the Chicago Tribune, described the Thompson Center “akin to Carmen Miranda crashing a black-tie ball.”<sup>12</sup> And while the exterior was causing a stir, the interior environment of the immense 178’ diameter, 18-story atrium—or rotunda—was contributing to the drama. The name calling is significant as the title rotunda places it firmly in the ring of civic buildings complete with a domed cylindrical form. The building contains, commerce, culture and the state offices of Illinois. This positions the project to challenge the various typologies.

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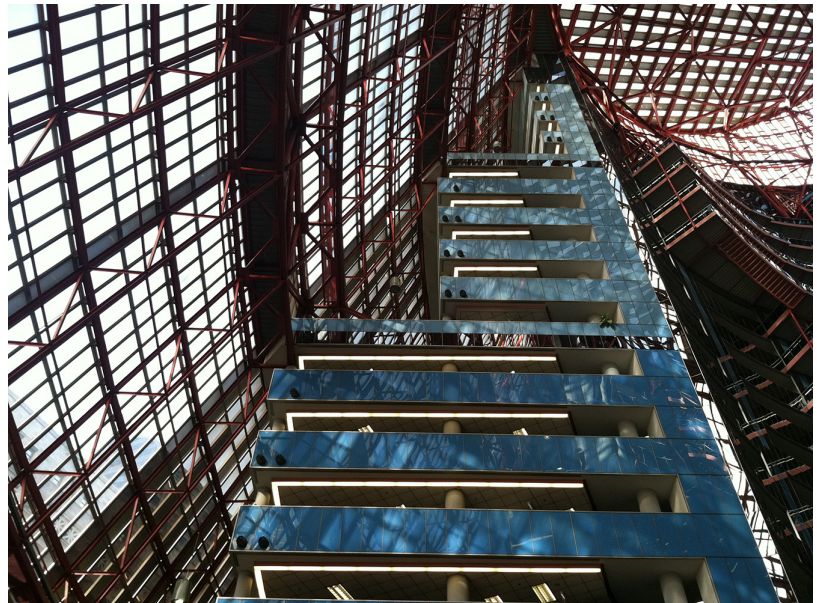


Figure 1: James R Thompson Center, Interior.

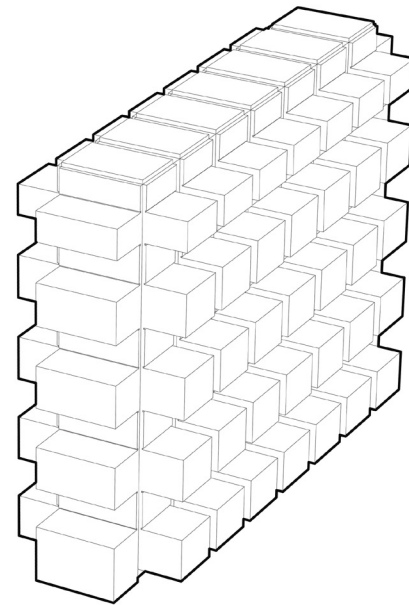
The project offers an insight into an interior that is in many ways larger than its exterior. The rotunda does not settle into the central position, waiting to be discovered; it vies for an urban presence. It is unruly and unable to be managed by the annular perimeter. The rotunda extends beyond the roof line and strains for a presence on the facade, flailing and displacing the thick programmatic perimeter only to be tenuously captured within the embrace of the skin. [Fig. 01] The tussle results in a full height presence on the urban facade, eroding the transitions typical between the street and central courts. The project engages multiple readings as it seeks enclosure and exposure, setting an example for the popularity of “mixed-use” to follow.

### LO-RES : HIGH IMPACT

A low-resolution strategy welcomes the registers of difference, acknowledging the complex relationship of two well-matched opponents. When thought of architecturally this is a productive way to develop the tension between interior and exterior. In other words, it incites an architectural wrestling match capable of repositioning recognizable elements. The architectural manifestation of shoulders, elbows and knees is full of potential as they work to create new grounds, forge unlikely connections and reorient expectations. In wrestling, pairs of evenly matched opponents strive to dominate one another. Balance and centrality are challenged. Inherent to the sport, placement of the figures are often off balance, centers are impossible to define and the location of extremities have endless variations. The project is present when deviation begins.

The typologies that have the most to gain from this curated tussle tend to engage architectural programs that require volume to negotiate between standardized repetitive spaces. Volumes with given names such as atriums, rotundas, light courts and central halls are most often found in typologies that house culture and commerce, such as grand hotels, visual arts centers and commercial headquarters. This relationship developed in the mid to late nineteenth century when projects began to distinguish themselves by their relationship between interior and exterior – consider the Rookery designed by Burnham and Root. Industrialization and the invention of political and architectural utopias offered an optimistic view of growth.<sup>13</sup> Today, the commercial atrium remains the most covert in the display of spatial ambitions. Excluding a few notable examples, such as Frank Lloyd Wright’s programmed light court, SOM’s stack and Philip Johnson’s connective plaza atrium, the commercial atrium has been spatially marginalized. It has been nudged and reshaped, but rarely able to dominate. Consider the Shops at Columbus Circle in the Time Warner Center: this multi-story atrium has its “face” pressed against the glass. A thin veil of glass separates the interior volume from the street. Without a threshold—gasp—it is in danger of relegation to an entry vestibule.

A closer look at Frank Lloyd Wright’s Larkin Administrative Building illustrates the innovative potential within the typology of the office building to create multiple interiors. [Fig 02] The Larkin building, even with its brief built existence of 46 years (1904-1950) and minimal critical reviews following its opening and demolition, it illustrates a project that valued volumetric potential in architecture. This building is of volumetric interest not solely based on the fact that the architecture contains a large volume within, but precisely because it does not contain the volume as much as the architecture is created by the wrestling of volume and massing. Sigfried Gideon describes this as interplay. For Gideon there was a clear



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Figure 2: Larkin Building Light Court, Diagram  
Excessive Volume Seminar, Jake Haggmark)

reciprocal relationship between the central internal volume, or what he calls, ‘the spatial unit’ and the square towers that flanked the building.<sup>14</sup> Most atriums, whether open to the sky or enclosed by glass, were usually just beyond the main entrance. In the case of the Wright’s atrium the entry sequence choreographed exposure by layering volumetric parts. This sequence was designed to insure ‘the discovery of the 76-foot-high light court in the main block came as a surprise, a moving revelation’.<sup>15</sup> The modulation of the surface in the interior court and the exterior massing, while rarely in physical connection appear to be in direct dialogue, there is an animated pushing of each other against the box.

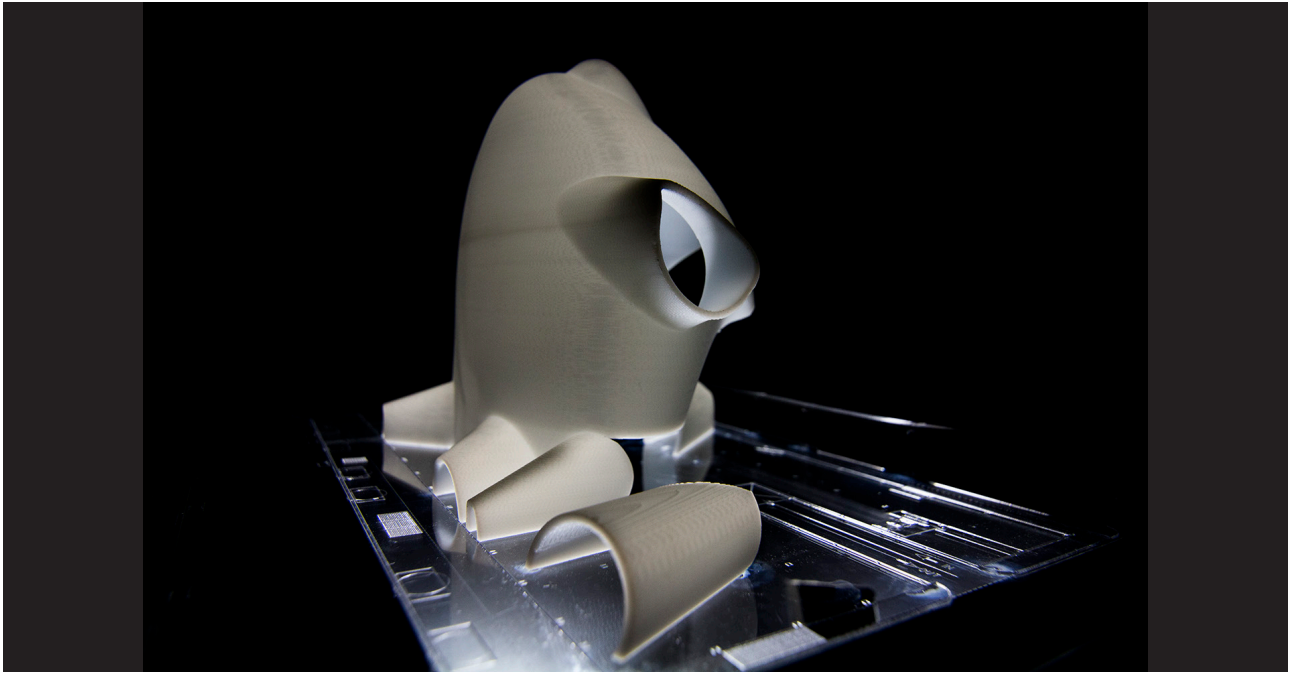
In the development of an architectural project the moments of a tangle are the most productive. Surfaces bunch, flip and pull tight as they seek new positions. Andrew Zago, a Los Angeles-based architect, is investigating this interest in what he calls the involute. The projects exploit incongruences, errors and the non-intuitive to produce uncanny sensations. Architectural contortion is on display in the massing of Zago’s project proposal for MOCAPE: Museum of Contemporary Art and Planning Exhibition for Shenzhen, China. [Fig. 03] The project employs an involuted cantilever in an attempt to reconfigure the urban tower. The result exposes the underbelly of the project. It expands the threshold as it hovers over the museum visitor.



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The competition entry the “Inverted Icon” highlights the potential of a complex interior to engage the thresholds of the city. In downtown Detroit, a city known for its vastness, the project contains a sprawling interior. The proposal rejects the object building strategy, opting instead to capture the immensity of Detroit’s urban landscape, ushering it inside, and therein creating an animated central volume for the city—an urban-scale room that channels Detroit’s morphology and facilitates its ambitions for renewed vibrancy. [Fig. 04, 05] The project consists of two major complementary elements: a voluminous, curvilinear interior room and a shard-like, articulated exterior. The internal volume connects this superblock-sized building to the city by extending to the perimeter, pulling pedestrians in through multiple passageways. These urban passages amplify the threshold by blurring and prolonging the moment of entry. Once fully inside, one finds a grand urban room on par with those historically found in rail stations, exhibition halls and factories. Filled with natural and artificial light, the loose figure of the central volume generates deep internal vistas to connect the project’s various programs. The speculative project contains a residential tower, office space and a film

Figure 3: Andrew Zago, *MOCAPE*, 2007



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incubator. The elbows and shoulder of the volume poke the perimeter shell, producing multiple outdoor rooms, including a highly visible blushing roof top plaza.

If modern architects have been reluctant to develop interior spaces as complex as their exterior shells, artists have long seemed willing and eager to experiment with the amplification of thresholds—and to uncover the emotional experiences this can educe. The perversion of norms stretches boundaries and encourages new relationships. Erwin Wurm engages social norms in the show *Gulp*, exhibited at the Lehmann Maupin Gallery in 2010. The piece *Big Gulp Lying* embodies the description, “Only through anarchic deviance is momentary individuality found, however, this requires abandonment of one’s familiar social context.”<sup>16</sup> The artist Alex Schweder perverts the functional requirements of architecture, creating art about spatial production. He asks the architectural surfaces to perform. He categorizes such work in the series *Roomograph*, *Wall to Wall Floor to Ceiling*, and *Sacs of Rooms All Day Long* as buildings that perform themselves. In the category *Rescued Spaces*, including *Snowballing Doorway* from 2008, he rearranges parts; thresholds are in a state of constant flux. Challenging interior conventions, Marcel Duchamp’s 1927 piece *Door: 11 rue Larrey* created a door that operated between two adjacent rooms, such that the rooms were never exposed simultaneously. Architects such as Edwin Lutyens and Richard Mique, have sporadically leveraged this ambiguity to alter spatial sequences and embrace surprise, disguising doors as walls or sliding vertical panels to reveal aperture. Managing complex interiors promises more of this.

The proliferation of complexity in architecture establishes a developed expertise that will only be in higher demand in the coming decades as technology and spatial ambitions become integrally linked. Defining and containing volume is a core aspect of architecture, one that was all but eliminated in the modernist turn toward universal space. Driven by both technology and ideology, modernists hollowed out the thick thresholds that historically differentiated a building’s volumetric interior from its massive exterior. I am not advocating a flip-flop from exterior complexity to interior, but rather an expansion of complex manipulation

Figure 4: *Inverted Icon-Interior*

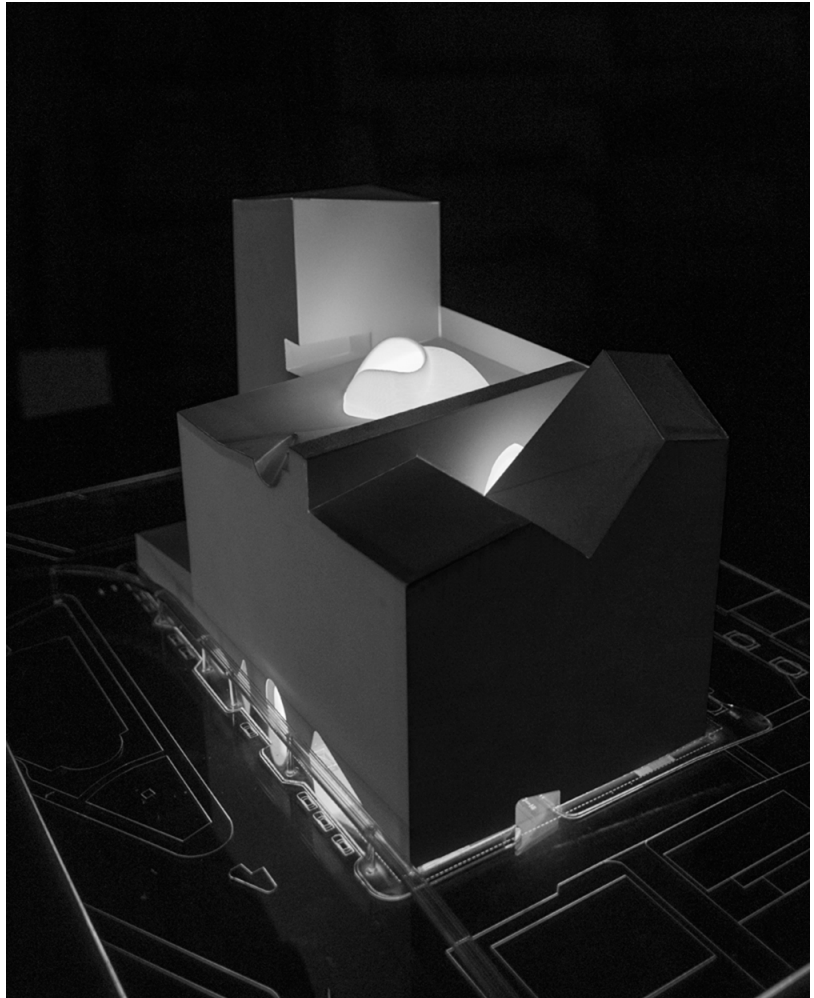


Figure 5: Author, *Inverted Icon-Exterior*

#### ENDNOTES

1. Kristy Balliet and Brennan Buck, "Programmed Poche," in *Visual Catalog: Greg Lynn's Studio*. Wien: Springer-Verlag, 2010.
2. Robert Venturi, "The Inside and the Outside," in *Complexity and Contradiction in Architecture*. New York: Museum of Modern Art, 1966.
3. Elias Cornell, "Going inside Architecture: A Tentative Synopsis for a History of the Interior", *Architectural History*, Vol. 40 (2007): 24-63.
4. Alois Riegl, *Late Roman Art Industry*, Rome: Giorgio Bretschneider Editore, 1985.
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9. Preston Scott Cohen, "The Hidden Core of Architecture", *Ibid.*
10. Wes, Jones, "Can Tectonics Grasp Smoothness?", *Log 30*, Winter 2014
11. Greg Lynn, "RV (Room Vehicle) Prototype: Where the Surface Meets the Machine", in *Inflexions* No.7 2014. Pg. 184-86. [http://www.inflexions.org/n7\\_lynn.html](http://www.inflexions.org/n7_lynn.html)
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14. Sigfried Giedon, 'Space, Time, and Architecture, the growth of a new tradition (Cambridge, Mass.: Harvard University Press, 1941) pp.420
15. Jack Quinan, 'Frank Lloyd Wright's Larkin Building, Myth and Fact', Chicago: The University of Chicago Press, 1987.
16. Press Release, "Erwin Wurm, 'Gulp'," *Lehmann Maupin Gallery*, 2010 [http://www.lehmannmaupin.com/exhibitions/2010-11-04\\_erwin-wurm/press\\_release](http://www.lehmannmaupin.com/exhibitions/2010-11-04_erwin-wurm/press_release)

to include the volumetric, the consequences of which will reintroduce the exterior and interior. The historic development of volume from an assembly of geometric thick primitives extruded, cut and attached to develop volumetric variation to a contemporary language of optical thickness that layers surfaces offers opportunities flush with potential to absorb technology, reinvent structural thickness and generate volumes that tactically slip in and out of containment to create a multitude of interiors—a contemporary enfilade.

Surpassing a singular interest in surface, a common limitation of digital work, the promotion of an interior complex engages novel volumetric relationships through the excessive build-up of geometric order. Carefully calibrated surfaces create voluminous interiors while dense arrays trap volume within thin gaps. Thus, what modernists dismissed as an unnecessary remnant of outdated modes of construction returns as a paramount concern. Volume is no longer the unintended space within or around mass; it is the number one focus and it is primed for an introduction to complexity.





# **ARCHITECTURE'S EXPERIMENTAL TURN- MODELS, PROTOTYPES AND TESTBEDS**

