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1 May 2024 | Draft

Implication of Mathematics in Human Experience from an AI Perspective

From sexual attraction to existential preoccupations of discipline practitioners

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Introduction

Scientists (and notably mathematicians) pride themselves on their objectivity and tend systematically to deprecate anything characterized as subjective or experiential. There is therefore a case for exploring how scientists engage with the experiential since this is the reality of life for many. There is a particular irony to the fact that practitioners of a wide range of disciplines would claim -- outside the framework of their discipline -- to appreciate the experiential and variously to indulge in subjectivity. It then follows, as explored here, that of particular interest is the manner in which sexual attraction and intercourse are framed by scientists with contrasting frameworks of expertise.

Rather than simple curiosity, the concern here is with the implication of those disciplines for the frameworks through which their practitioners view the subjective reality of those who do not benefit from their insights. This concern may well extend to policy-makers and legislators who are typically not

elected for their expertise in a wide range of disciplines. Potentially especially problematic is the extent to which sexual attraction and its consummation are a major preoccupation for many and are particular concern in any form of public relations and marketing. One typical condemnation of strategic proposals is that their presentation is not sufficiently "sexy" -- whatever that is held to mean. Such appreciations are necessarily deprecated as irrational from the perspective of most disciplines.

It follows that proposals for global governance (and the strategic response to crises) are systematically undermined by the value associated with the experiential in contrast with the objective and rational. This concern is of particular relevance to the manner in which sexual attraction and intercourse can be seen as the fundamental drivers of global dynamics and the problematic consequences to which these currently give rise. Such consequences in terms of burgeoning populations are beyond question in any rational terms -- or rather such rationality on the part of eminent authorities is discounted as indicative of hidden agendas. The irony is all the greater in that there is widespread recognition of the sexual "scandals" with which those in authority continue to be associated, and the speculation which that may evoke (*Planetary Impalement by Stakeholder Capitalism?* 2023; *Problematic Sexual Paradoxes of Pandemic Response*, 2021).

This exploration follows from an earlier exercise highlighting AI perspectives on balancing integration and identity faced by strategic complexity (*Mathematical Modelling of Silo Thinking in Interdisciplinary Contexts*, 2024). The silos of that exercise could be recognized as the disciplines here. As with the following, the articulation of the argument is developed with extensive use of ChatGPT (and specifically its Scholar.ai plugin) as an experimental presentation in its own right. The responses to prompts are presented below in grayed zones for clarity.

The argument concludes with reference to the insights that mathematics might offer to the experiential prospect of collapse, whether in the case of a civilization, a culture, a group, or an individual. This is consistent with widespread at this time with regard to [societal collapse](#) -- the collapse of civilization as currently known (Paul R. Ehrlich, et al, *Can a collapse of global civilization be avoided?*. *Proceedings of the Royal Society B*. 280, 2013, 1754; Thomas Homer-Dixon, *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*, Island Press, 2006).

Given the manner in which the prospect of renewal tends to be framed in terms of "renaissance", and the sexual implications of that metaphor, a question is how mathematicians can reframe their recognition of creativity with such experiential implications.

Sexual attraction as framed by practitioners of conventional disciplines?

Question to ChatGPT: Could you speculate briefly on how the practitioners of different academic disciplines might distinctively frame their experience of sexual attraction and their engagement in sexual intercourse. Disciplines of interest might include: physics, sociology, statistics, psychology, topology, education, law, economics, demographics, agriculture, biology, ecology, geology, mining, chemistry, engineering, politics, martial arts, psychoanalysis, and theology

Exploring how practitioners of different academic disciplines might distinctively frame their experiences of sexual attraction and engagement in sexual intercourse involves delving into the unique lenses and terminologies that each field utilizes to interpret personal and social phenomena. Here's a speculative, light-hearted look at how these disciplines could interpret these aspects of human experience:

- **Physics:** Sexual attraction could be described in terms of forces and fields, similar to gravitational or electromagnetic forces, where attraction varies inversely with the square of the distance.
- **Sociology:** Focus on the social constructs and cultural norms that influence sexual behaviors and perceptions of attraction, examining how these elements vary across different societies.
- **Statistics:** Interested in the probabilities, correlations, and trends regarding sexual behaviors, possibly using models to predict factors influencing sexual attraction based on

demographic data.

- Psychology: Analyze the psychological processes and emotional dynamics driving attraction and sexual behavior, considering aspects like attachment styles, desires, and inhibitions.
- Topology: Might humorously describe relationships and sexual interactions as exercises in understanding connectedness, continuity, and the properties of space that remain invariant through deformation.
- Education: Concerned with how sexual education influences sexual behavior and attitudes towards sex, focusing on pedagogical approaches and knowledge dissemination.
- Law: Examines the legal implications of sexual interactions, focusing on consent, age of consent laws, and legal distinctions between different types of sexual behavior.
- Economics: Could analyze sexual interactions in terms of supply and demand, market dynamics, and incentives, or even consider the costs and benefits of relationships.
- Demographics: Look at population-wide patterns in sexual behavior, analyzing trends over time and how they relate to other demographic shifts.
- Agriculture: Might analogize aspects of breeding, growth, and cultivation seen in farming to human relationships and sexual behavior.
- Biology: Focus on the physiological and genetic aspects of sexual attraction and reproduction, examining hormonal influences, reproductive strategies, and biological imperatives.
- Ecology: Consider sexual behavior in the context of ecological systems, interactions, and the balance of natural habitats.
- Geology: Could metaphorically describe sexual relationships and attractions using geological processes like tectonic shifts, erosion, or volcanic activity—slow changes and sudden eruptions.
- Mining: Might describe the exploration of deep, hidden aspects of human attraction and the processes of discovering and extracting valuable elements from within.
- Chemistry: Talk about sexual attraction in terms of chemical reactions, bonding, solutions, and precipitates—what elements mix well and which ones react explosively.
- Engineering: Could view sexual interactions as systems with inputs and outputs, stresses and strains, efficiencies, and designs optimized for performance.
- Politics: Might analyze the power dynamics, negotiations, and strategic alliances within sexual relationships.
- Martial Arts: Interpret sexual dynamics in terms of balance, force, technique, and the interplay of mental and physical discipline.
- Psychoanalysis: Deep dive into the unconscious motivations behind sexual desires and behaviors, exploring themes of libido, repression, and symbolic meanings.
- Theology: Discuss sexual morality, sin, and purity from a spiritual perspective, often focusing on the ethical and moral implications of sexual behavior within religious contexts.

This speculative exploration demonstrates how academic disciplines can apply their unique perspectives to interpret complex human behaviors, including sexual attraction and intercourse. Each discipline provides a distinct framework, reflecting its foundational theories, methodologies, and priorities.

It is of course the case that the nature and role of subjectivity in relation to objectivity is a continuing concern, as may be variously highlighted ([A Subjective Objection: Objecting to Subjection](#), 2016; [¿ Defining the objective ∞ Refining the subjective ?! Explaining reality ∞ Embodying realization](#), 2011; [Conditions of Objective, Subjective and Embodied Cognition](#), 2007).

The limitations of the objective framing with respect to this argument are ironically indicated in the use of statistics ((Stephen J. Ceci and Wendy M. Williams, *The Mathematics of Sex*, 2009; Clio Cresswell, *Mathematics and Sex*, 2004). Interest in the cognitive and topological implications of "intercourse", whereby mathematicians are engendered, would appear to be prudishly restricted to those of the tantalizing title of Roy Wagner ([Mathematical Marriages: intercourse between mathematics and semiotic choice](#), *Social Studies of Science*, 39, 2009, 2, pp. 289-308) who argues:

The production of mathematics is, to a large extent, a semiotic activity. Much of what a mathematician does is to manipulate symbols and words. Nevertheless, mathematics is the one

domain of knowledge that is most exposed to a myth of pure and ideal transcendence beyond the symbols in which it is engraved. The purpose of this essay is to analyse how language may shape mathematical considerations.

The remarkable capacity of mathematicians in quantitative operations seemingly has no qualitative correspondence, as separately explored (*Reframing the Dynamics of Engaging with Otherness*, 2011). Particular recognition has been given to the experience of doing maths in a classical study (Philip J. Davis and Reuben Hersh, *The Mathematical Experience*, 1981). The self-referential question is whether understanding mathematical experience is itself informed by mathematics.

Question to ChatGPT: Those responses tend to place the emphasis on how sexual engagement can be distinctively analyzed. However the question sought to clarify how the discipline in question might frame the subjective experience of attraction and intercourse by the practitioner of the discipline -- rather than through the objectivity offered by any analytical process

Focusing on how practitioners of different academic disciplines might subjectively experience and interpret their own feelings of sexual attraction and engagement in sexual intercourse offers an interesting perspective. Here's a speculative look, exploring how their specialized knowledge and frameworks might color their personal experiences and interpretations:

- **Physics:** A physicist might perceive sexual attraction as a captivating natural phenomenon akin to gravitational pull -- where two bodies are drawn to each other with a force that increases as they get closer, similar to how objects are attracted by gravity -- something inevitable and profound, driven by an almost cosmic alignment of energies.
- **Sociology:** Sociologists might view their personal experiences of attraction through the lens of social conditioning, wondering how much of their feelings are shaped by societal expectations and cultural narratives. Sociologists might use the metaphor of a 'social construct' to describe sexual attraction, emphasizing how societal norms and cultural contexts shape and define what is considered attractive.
- **Statistics:** A statistician might humorously think about the odds of meeting someone compatible, mentally calculating the likelihood of various outcomes in social situations. Statisticians could describe attraction using the metaphor of a probability distribution, where the likelihood of attraction varies across a population and can be predicted by certain factors.
- **Psychology:** Psychologists could be introspective about their feelings of attraction, analyzing their emotions and reactions in the context of psychological theories such as attachment styles or emotional intelligence. Psychologists might describe attraction and intercourse as points on an emotional spectrum, where feelings range from mild interest to deep emotional connection.
- **Topology:** Topologists might find the concept of being connected or intertwined with someone else fascinating, imagining the continuous transformation of their personal and emotional landscapes. Topologists might use the metaphor of continuously deforming surfaces, like a Möbius strip, which twists and turns in unexpected ways, much like the complexities of human relationships.
- **Education:** Educators might reflect on their interactions and attractions as learning experiences, considering what each relationship teaches them about themselves and others.
- **Law:** A lawyer might be acutely aware of the legal implications of their actions in relationships, always considering consent and ethical boundaries very consciously.
- **Economics:** Economists could approach relationships and sexual interactions as transactions, considering costs, benefits, and resource allocations in their personal decisions.
- **Demographics:** Demographers might be interested in how their personal choices fit into wider population trends, perhaps pondering the statistical rarity or commonality of their relationships.
- **Agriculture:** Those in agriculture might liken their relationships to seasons—periods of growth, harvest, and sometimes fallow, with each phase bringing its own rewards and challenges.
- **Biology:** Biologists might view attraction and intercourse through the lens of human biology, perhaps marveling at the natural instincts and biological drives that influence their behaviors. Biologists could describe sexual attraction using the metaphor of biochemical reactions, where certain chemicals (like hormones) activate specific reactions leading to feelings of

attraction.

- Ecology: Ecologists could see their relationships as ecosystems, where balance, diversity, and interdependence are crucial for a healthy dynamic.
- Geology: Geologists could perceive emotional and sexual layers building up over time, with pressures and historical layers forming the foundation of their relationships.
- Mining: Those in mining might see discovering a new relationship as unearthing a rare gem or valuable mineral, each layer revealing more depth and complexity.
- Chemistry: Chemists might feel as though every new attraction is a fascinating chemical reaction, with each interaction potentially leading to unexpected results. Chemists might use the metaphor of chemical bonds to describe relationships, where bonds vary in strength and type (ionic, covalent, metallic) just as human connections do.
- Engineering: Engineers could view building a relationship as constructing a bridge or building—requiring careful planning, strong materials, and regular maintenance. Engineers might view relationships as structures that need sound foundations and careful maintenance to withstand the stresses and pressures of life.
- Politics: Politicians or those interested in politics might see every personal interaction as a campaign or negotiation, where power dynamics and alliances play a significant role.
- Mathematics: Mathematicians could describe relationships as complex equations that require solving for unknown variables, where the solutions provide insights into the dynamics of the relationship.
- Computer science: Computer scientists might describe attraction and relationship dynamics as algorithms, where inputs (traits, interests) are processed to yield outputs (compatibility, relationship stability).
- Martial Arts: Practitioners of martial arts might approach relationships as they do sparring: a dance of give and take, where respect, boundaries, and the right timing are crucial.
- Psychoanalysis: Psychoanalysts might delve deep into their subconscious to understand their attractions, viewing relationships as a confluence of surface interactions and deeper, unconscious currents.
- Theology: Theologians might reflect on their personal experiences of love and attraction as part of a divine plan or a moral test, with each relationship having spiritual significance.

This approach shows how the theoretical knowledge and habitual frameworks of each discipline could subtly influence how practitioners understand and experience their personal lives, including the realms of attraction and intimacy. The metaphors not only provide colorful and relatable ways to describe complex feelings but also reflect the unique perspectives that different disciplines bring to understanding human emotions and relationships.

The brevity of the responses (as requested) can only suggest what metaphors the practitioners of a discipline might employ in order to reframe the challenge of subjective experience (and its often chaotic manifestations).

Question to ChatGPT: The disciplines selected as examples for the exercise might be understood as reflecting a particular bias. Could you extend the exercise to any other disciplines which might offer a more balanced or complementary range

Extending the exercise to a more diverse range of disciplines can provide a richer and more inclusive perspective on how practitioners might subjectively experience and interpret sexual attraction and engagement in sexual intercourse. Let's explore additional disciplines, including humanities, arts, and more specialized sciences:

- Anthropology: Anthropologists might view their personal experiences of attraction and relationships through the lens of cultural relativity, considering how different cultures interpret and express love and sexuality.
- Art History: Art historians could see romantic and sexual experiences as akin to movements in art, each relationship reflecting different styles, emotions, and historical contexts, much like the periods they study.
- Linguistics: Linguists might be particularly attuned to the role of language in forming and expressing attraction, fascinated by the nuances of verbal and non-verbal communication in their personal interactions.
- Philosophy: Philosophers might ponder the ethical dimensions of attraction and

relationships, questioning the nature of desire, consent, and the moral implications of their actions.

- Music: Musicians and musicologists might experience and interpret their romantic interactions as compositions, where rhythms, harmonies, and dissonances play out over time, creating a unique emotional resonance.
- Neuroscience: Neuroscientists could be intrigued by the brain's role in attraction and love, perhaps analyzing their feelings and reactions in terms of neural circuits and chemical reactions.
- Veterinary Sciences: Veterinarians or animal scientists might see parallels between human and animal mating behaviors, reflecting on how instinctual and learned behaviors influence their own relationships.
- Urban Planning: Urban planners might conceptualize their relationships as part of a larger community or ecosystem, considering how spatial arrangements and environments influence social interactions and intimacy.
- Culinary Arts: Chefs or culinary experts might perceive relationships as recipes, where the right mix of ingredients, timing, and techniques are essential for creating something delightful and satisfying.
- Sports Science: Sports scientists or athletes might view their romantic partnerships as akin to teamwork in sports, where coordination, fitness, and goal-setting are vital for a successful outcome.
- Literary Studies: Literary scholars might frame their romantic and sexual experiences in terms of narratives, with each relationship developing like a plot with characters, tensions, and resolutions.
- Astronomy: Astronomers might see romantic interactions as cosmic events, where alignments, orbits, and gravitational pulls between celestial bodies mirror their personal experiences of attraction.
- Environmental Science: Environmental scientists might think about relationships in terms of sustainability and impact, considering how their personal choices affect their immediate environment and the broader world.
- Archeology: Archaeologists might view personal relationships as excavations, where digging deeper can uncover hidden treasures or forgotten stories, layer by layer.
- Dance: Dancers could interpret their experiences of love and attraction through movement and flow, each interaction a dance that speaks through body language and emotional expression.

This expanded list of disciplines demonstrates the rich variety of perspectives that different fields can bring to the understanding of human relationships and sexuality. Each discipline offers unique metaphors and frameworks that reflect its specific focus and methodologies, enriching our understanding of the subjective human experience.

Of potential relevance are the many comments that have been evoked by the following questions on Quora:

- [What type of scientists have the most or least amount of sex, and why?](#)
- [What is it like to have sex with a scientist?](#)

Implication for academic disciplines of the "sex life" of their practitioners

Given the wide variety of surveys conducted in relation to sex, seemingly missing is a survey of the "sex life" of practitioners of particular disciplines -- with the implications for their practice. An unexpected example is offered by one of the most influential economists (Sean O'Grady, [The amazing sex life of economist John Maynard Keynes](#), *Financial Review*, 17 March 2015). Curiously that discipline has resulted in studies of [sexual economics](#), as originally proposed by Roy F. Baumeister and Kathleen D. Vohs, [Sexual Economics: sex as female resource for social exchange in heterosexual interactions](#), *Personality and Social Psychology Review*. 8, 2004, 4). This relates to how participants think, feel, behave and give feedback during sex or relevant sexual events. With sex defined as a marketplace deal, the theory states that the thinking, preferences and behavior of men and women follow the fundamental economic principles

Question to ChatGPT: Do you have any trace of studies of the "sex life" of practitioners of any disciplines listed in this exchange -- in the light of recognition of the "amazing sex life" of John Maynard Keynes, and the influence it may have had on his practice of economics

The exploration of John Maynard Keynes' personal life, particularly his sex life, and its influence on his economic theories is a topic of both curiosity and scholarly interest, though it is not extensively covered in the academic literature directly relating to his economic contributions. While there are numerous studies on Keynes' economic theories and methodologies, specific insights into how his personal life, including his sex life, may have influenced his economic thoughts are less frequently addressed in academic papers. Here's a synthesis of the information available:

- **General Influence on Economic Thought:** There is acknowledgment that John Maynard Keynes was a complex figure whose personal and professional lives were deeply intertwined. His broad interests and personal experiences undoubtedly shaped his perspectives and intellectual approaches [Barkin Cihanli, [On the Evolution of Keynes' Economic Thought](#), SSRN, 2021]
- **Limited Direct Analysis:** Direct analysis linking Keynes' sex life with his economic theories is scarce. Most academic work focuses on his economic methodologies and philosophies without delving deeply into his personal life as a direct influence on these theories. For example, works like "Keynes et ses combats" focus on his multifaceted professional life and battles within the realms of economics, philosophy, and politics, rather than on personal relationships or sexual experiences [Maxime Ouellet, [Keynes et ses combats](#), *Canadian Journal of Political Science*, 2007]
- **Cultural and Philosophical Influences:** Some discussions about Keynes' broader cultural and social engagements suggest that his personal philosophies, possibly influenced by his personal life, affected his views on economics and society. However, these discussions rarely provide a direct causal link between his sexual orientation or experiences and his professional work.
- **Biographical Accounts:** While not strictly academic, biographical accounts of Keynes' life sometimes discuss his personal life and relationships more openly and speculate on their impact on his views and writings. These accounts often portray a picture of a man whose personal and professional lives were richly entangled, with his progressive and sometimes unconventional views reflecting both his personal experiences and his economic thinking.

In conclusion, while John Maynard Keynes' personal life, including his relationships and possibly his sex life, was undoubtedly a significant aspect of his identity, the direct impact of these factors on his economic theories is not extensively documented in the economic literature. The academic focus remains primarily on his contributions to economic theory and practice, with personal aspects noted more in biographical rather than analytical contexts.

Question to ChatGPT: That response focuses solely on Keynes whereas the question related to the array of academic disciplines and their practitioners

Exploring how the personal experiences, including the sex lives of practitioners across various academic disciplines, influence their professional practice reveals a complex and nuanced landscape. The studies highlighted provide some insights but generally focus on specific professional contexts rather than a broad academic survey across disciplines:

- **Sexologists as Educators:** A study on the role of sexologists as educators highlights their influence as agents of social change, suggesting that their personal experiences and understanding of sexuality could significantly impact their professional effectiveness and perspectives [Sofia Achem et al., [El Rol del Sexologo como Educador Sexual](#), *Revista De La SASH*, 4, 2023,2]
- **Sex Education Teachers:** Another study, "Sexing the Subject," discusses the link between practitioners' sexual history and their teaching methods in sex education, emphasizing how personal experiences of educators impact their pedagogical approaches and potentially the educational outcomes [M. Kehily, [Sexing the Subject: Teachers, pedagogies and sex education](#), *Sex Education*, 2, 2002, 3]
- **Professional Life and Sexual Experience:** Research by Verónica Policarpo examines the interplay between professional life and sexual experience among Portuguese individuals,

shedding light on how professionals navigate their personal and professional spheres, which could influence how they manage professional responsibilities and personal identities (Verónica Policarpo, [Sex life under fire: impacts of working life on the construction of the sexual experience](#), *Sociologia*, 89, 2019)

- Sexuality in Healthcare and Social Work: The impact of sexuality in healthcare and social assistance relationships is explored in a study focusing on how professionals deal with the sexual lives of individuals they care for. This interaction undoubtedly shapes professional practices and could influence how these professionals view and integrate notions of sexuality into their work [Pierre Moulin, [The Construction of Sexuality in Health and Social Work Professionals or the Normalization of Layman Behaviors](#), *Nouvelle revue de psychosociologie*, 4, 2007, 2]

These studies suggest that while direct research connecting the sex lives of academics across all disciplines with their professional work is limited, there is evidence within specific fields, such as sexology and education, that personal experiences with sexuality do impact professional perspectives and practices. The influence is seen mostly in fields directly related to human behavior and social interactions, where personal understandings of sexuality can profoundly affect professional conduct and the framing of educational content. This intersection underscores the importance of considering personal dimensions when evaluating professional roles and contributions in fields dealing with human relationships and societal norms.

That response (and the references offered) would appear to suggest the limited exploration of the relevance to other disciplines.

By contrast, in his discussion of [Marie Curie](#) (known for her pioneering research on radioactivity), Tom Wilkie argues that the private lives of scientists reveal much about the way they work and the discoveries they make ([The secret sex life of Marie Curie](#), *The Independent*, 13 June 1995). The practice of a discipline may even be upheld as "better than sex" ([What's so sexy about math?- A TED Talk by Award-winning mathematician Cédric Villani](#), *Medium*, 3 December 2019; Donald C. Benson, [The Moment of Proof: mathematical epiphanies](#), Oxford University Press, 1999). Relevant comments have been evoked by a question to *Quora* ([What are the sex lives of mathematicians and physicists like?](#))

Question to ChatGPT: The quest for such traces might be more fruitful if it focused on recognition of the "passionate" engagement with sex of practitioners of academic disciplines, as with the case of Marie Curie

Exploring the passionate engagement of practitioners across various academic disciplines with their work, often analogized to sexual passion due to the intense dedication and love for their fields, yields interesting insights. Here are some thoughts and potential studies that touch on this aspect, although direct studies focusing specifically on the sexual lives of practitioners like Marie Curie and its impact on their scientific work are scarce:

- Passionate Engagement in Science: Historical accounts and biographical studies of figures like Marie Curie suggest that their devotion to their work can be compared to a form of passion often seen in personal relationships. This analogy highlights the deep emotional engagement and tireless dedication they had toward advancing their fields, which can be metaphorically likened to the dynamics of a romantic relationship [Bernard Simon Talmey, [Love; a Treatise On the Science of Sex-Attraction](#)].
- Impact on Pedagogy and Practice: In fields like sex education, the personal experiences and passions of educators can significantly influence their teaching methods and how they engage with students. This interaction not only affects educational outcomes but also shapes the pedagogical approaches adopted by educators [m. Kehily, [Sexing the Subject: Teachers, pedagogies and sex education](#), *Sex Education*, 2, 3]
- Professional Life and Sexuality: Studies focusing on professions that deal directly with human behavior, such as sexology, often explore how personal beliefs and experiences with sexuality influence professional practices. These studies can provide insights into how personal dimensions of sex and relationships impact professional decisions and patient interactions in fields like healthcare and social work [Kevin Reel, [Sexuality in Rehabilitation: Supporting Canadian Practitioners Conceptually Towards Client Enablement](#), *Canadian*

Journal of Bioethics, 1, 2018, 3]

- Cultural and Ethical Considerations: The integration of personal experiences with professional responsibilities can be particularly pronounced in fields dealing with intimate aspects of human life, such as nursing or sexology. The practitioners' own views on sexuality and relationships could profoundly influence how they approach topics like sexual health and patient care Sofia Achem et al., *El Rol del Sexologo como Educador Sexual*, *Revista De La SASH*, 4, 2023,2]

While the direct correlation between the sex lives of academic practitioners and their professional efficacy or creativity is not extensively documented, the analogy of passionate engagement provides a useful framework for understanding the depth of commitment and emotional investment that top scholars and researchers bring to their disciplines. This perspective underscores the holistic nature of how personal experiences can enrich professional endeavors, fostering a deeper understanding and innovative approaches within their fields.

As evoked above, the conceptual implications of the sexual experience of academic professionals could be readily framed as unreasonable, if not irrelevant. It is therefore appropriate to compare it with the credibility accorded to exploration of the religious experience of academic professionals (Elaine Howard Ecklund, et al, *Religion among Scientists in International Context: a new study of scientists in eight regions*, *Socius: Sociological Research for a Dynamic World*, 2, 2016), as discussed by Anne Marie Conlon (*How religious scientists balance work and faith*, *Nature*, 20 May 2024). That review notes the survey by sociologist Christopher Scheitle of more than 1,300 graduate students about the "struggle" they face with regard to their experiences and their attitudes to religion (*The challenges of being a religious scientist*, *The Conversation*, 28 November 2023). Scheitle found that many religious people studying science struggle to be open about their faith, reporting a culture of 'assumed atheism' that often led them to conceal their religion for fear of being judged or discriminated against.

Given the prevailing scientific deprecation of the inherent irrationality of spiritual experience, it is curious that no corresponding study has seemingly been made of the "struggle" of sexually active academics in reconciling their experience with their conceptual frameworks. This could be considered especially ironic given the current credibility accorded to the "non-binary" frameworks associated with the LGBTQIA+ community (*Global Civilization through Interweaving Polyamory and Polyanimosity?* 2018).

Potentially even more provocative are the implications of an essay by Danny Calegari from a mathematical perspective (*Disappointment*, *Notices of the American Mathematical Society*, September 2023). This featured in an interview of the author by Jordana Cepelewicz (*How Failure Has Made Mathematics Stronger*, *Quanta Magazine*, 22 May 2024). The provocation lies in the implications of any correspondence between experience of "sexual dysfunction" and of "mathematical dysfunction" in the light of an alleged equivalence between them (Manya Raman Sundström, *The maths drive is like the sex drive*, *New Scientist*, 28 January 2015; Cédric Villani, *What's so sexy about math?- A TED Talk*, *Medium*, 3 December 2019). Especially curious are the mathematical models that underpin sexual success (Hannah Fry, *The Mathematics of Love*, 2015)

Question to ChatGPT: Is there a case for recognizing the number and variety of curves, as mathematically defined, which frame the strange attractor of a female as experienced by a male. Arguably it is not the static form of such curves alone but some measure of their dynamics, as potentially suggested by harmonic analysis. Is there any trace of such research

The concept you're exploring -- examining the attraction dynamics using mathematical frameworks like curves and harmonic analysis -- is a unique and sophisticated intersection of mathematics, physics, and human psychology. While the notion of using such precise mathematical tools to describe aesthetic and emotional human experiences, such as attraction, might seem abstract, it taps into a longstanding tradition in both the arts and sciences of trying to quantify and understand beauty and human relationships through geometrical and mathematical principles.

- Theoretical Frameworks and Approaches:
 - Curves and Geometry in Human Aesthetics:
 - Historically, artists and scientists have tried to capture what might be considered

the 'ideal' or aesthetically pleasing forms through mathematical proportions and curves. For example, the Golden Ratio has been famously associated with human beauty and architectural aesthetics.

- In terms of human form, curves play a significant role in artistic representations and are often highlighted in discussions of human beauty, using principles from geometry and dynamic systems.
- Dynamic Systems and Attraction:
 - The concept of a "strange attractor" comes from chaos theory, where it represents a condition in a dynamic system in which the system tends to evolve, no matter how it started. Applying this to human interaction, attraction could theoretically be modeled as a dynamic system where multiple variables (including physical appearance, as described by curves, and personality traits) interact over time in complex ways.
 - Harmonic analysis, which involves studying functions or signals in terms of basic oscillating components (waves), could theoretically be applied to analyze movements, speech patterns, and other dynamic behaviors in human interactions.
- Research in Related Areas:
 - While direct research into using harmonic analysis or complex mathematical curves to study human attraction specifically might not be widely documented, interdisciplinary fields like psychophysics, neuroaesthetics, and evolutionary psychology explore related concepts.
 - Psychophysics often investigates the relationship between physical stimuli and the sensations and perceptions they produce, which could theoretically encompass how physical forms and dynamics are perceived as attractive.
 - Neuroaesthetics looks at how the brain perceives beauty, which could include mathematical or geometric patterns in visual forms.
 - Evolutionary Psychology might explore how certain physical characteristics are preferred based on underlying genetic, health, or fertility indicators, which could be abstractly modeled through curves and dynamics.
- Practical Applications and Ethical Considerations:
 - Modeling and Simulation: Using mathematical models to simulate human aesthetic responses or attraction could offer insights in fields like virtual reality, game design, or even robotics. However, the complexity and subjectivity of human emotions make this a challenging endeavor.
 - Ethical Concerns: There is a significant ethical dimension to considering how and why we might attempt to quantify human attributes and interactions. The reduction of human experiences and qualities to mathematical models might oversimplify the richly diverse and deeply personal nature of human relationships.

In conclusion, while there isn't a substantial body of research directly linking the dynamics of curves as "strange attractors" in a mathematical sense to human attraction, the idea of using mathematical and geometric principles to understand human aesthetics and interaction remains a topic of interest across several scientific and artistic disciplines. The application of these concepts must be approached with an awareness of both their potential and their limitations, particularly considering the deeply subjective nature of beauty and attraction.

Body metaphors, sexualization and embodiment

Unfortunately these examples do not highlight how insights from the discipline may frame the experience of sexual attraction and intercourse -- potentially suggesting that little attention has been devoted to the matter. Valuable exceptions are offered by [Henri Van Lier](#) (*Mathematics and Sexuality*, *Anthropogenie*, 2008) and [Yan Kow Cheong](#) (*Mathematics and Sex*, *Humanistic Mathematics Network Journal*, 22, 154, January 2000). A distinction needs to be made from the less relevant studies of the application of mathematics, notably statistics, to the study of sexuality ([Clio Cresswell](#), *Mathematics and Sex*, 2003).

It is unclear how relevant is the existence of the surprisingly large number of porn websites variously referring to mathematics and mathematicians. Contrasting implications follow from the assumption that these are attractive to some mathematicians, or alternatively that intercourse with mathematicians is a fantasy cultivated by many.

Of relevance, but more problematic at this time, are implications associated with the "sexualization" of various disciplines (Helene Götschel, *Looking at High Energy Physics from a Gender Studies Perspective*, CERN Special Science and Society Colloquium, 2011). Also of potential relevance is the work on *force-field theory* of Kurt Lewin (Ernest R. Hilgard, *Lewin's Topological and Vector Psychology, Theories of Learning*, 1948).

This is most evident in the use of body metaphors and related sexual processes, surprisingly recognized with respect to geology, for example (T. Pico, *Body Metaphors in Field Geology: implications for gender- or sex-based harassment*, American Geophysical Union, 2019). The use of such metaphors has long been recognized in connection with sport and military activity -- transferred to common business discourse (with regard to competitors) and back to the reframing of sexual engagement ("scoring").

Another example is offered by the range of references to "sexual geography" (Valerie De Craene, *Geographies of Sexualities: Bodies, Spatial Encounters and Emotions*, *Journal of Economic and Human Geography*, 108, 2017, 3; Phil Hubbard, *Geography of Sexuality*, *Oxford Bibliographies*, 2013). Hubbard notes:

Geography as a discipline has been reticent about recognizing that sexuality is foundational to the making of social and spatial orders (cf. class, race, or gender). Initial work on geographies of sexuality was therefore restricted to consideration of "zones of vice" and studies of prostitution...

Particular controversy has been evoked by the extent of sexualization of video games and the surprising development of so-called "breast physics", otherwise known as "jiggle physics" (extended to include "butt physics" and "ass physics"). This focuses on the representation and dynamics of primary sexual attractors -- distinct from the objective engineering focus on sports bra structure (Debbie Risius, et al., *Bouncing Breasts: the science of the sports bra*, *The Conversation*, 9 August 2012). This notes the preoccupation with biomechanical, physiological and clinical perspectives. Surprisingly consistent with that preoccupation, despite the promise of the title, is the innovative technological possibility of an energy-generating bra (Adrienne So, *Harnessing the untapped power of breast motion*. *Slate*, 23 June 2008). Quora has offered the question: *What's wrong with realistic jiggle physics? In the real world, are we not fighting for the rights of women to wear what they want, including not wearing a bra?*

Other than a preoccupation with *soft-body dynamics* for video game sexualization, there is seemingly little concern from a mathematical perspective with how breast movement functions as one of the most powerful "strange attractors". There is of course no lack of commentary on why men are so powerfully attracted to breasts (Natalie Wolchover, et al, *New Theory on Why Men Love Breasts*, *Live Science*, 17 March 2016; Rajeet Singh, *Why Men are Fascinated by Breasts*, *Medium*, 2 August 2020; Christopher Ryan. *Why Do Breasts Mesmerize? What explains the transcendent power of breasts?* *Psychology Today*, 23 April 2010). An aspect of the missing cognitive approach can be recognized in the work of Claus-Christian Carbon (*Cognitive Mechanisms for Explaining Dynamics of Aesthetic Appreciation, i-Perception*, 2, 2011, 7).

A significant difficulty in exploring potentially relevant references relating to sexualization is the extent to which its cognitive dimensions have been appropriated -- understandably -- from a feminist perspective, or otherwise distorted. A prime example is a description of "sexual physics" in the *Uncyclopedia*.

The sexualization of philosophy is the theme of Jean-François Lyotard (*The Libidinal Economy*, 1974). As discussed by Riley Clare Valentine:

Lyotard's usage of desire in a political economic philosophy text is unique. It recognizes the importance of desire in our lives and hints that economic decisions are as driven by desire as they are by reason. Lyotard's sexualization of philosophy is striking from a contemporary context, in which political philosophy has distanced itself from the frankness of sexual desire. However, desire and sex are at the heart of many political debates. A popular critique of abortion by anti-abortion activists is that it is used as birth control by people who want to have sex without

contraception. Their sexual desire is framed as voracious, a person who does not or perhaps refuses to control their sexuality with their reason.... Recent legislation in the United States focuses upon the development and suppression of desire seen as deviant. To understand the implications of these laws, it is imperative to engage with legal embodiment. ([Libidinal Politics: the role of sexuality and desire in legal embodiment](#), *Philosophy Monthly*, 67, November 2023).

Valentine concludes:

It remains to be seen what future will emerge from this reaction to curb desire. However, if we are to engage with a political philosophy of futurity, we ought to reconsider Edelman's suggestion that [jouissance](#) ought to replace the Child as the future. *Jouissance* pushes us towards a future of transgression, in which the limitations of traditional heterosexual patriarchal forms of desire are upended, and, rather than the Child, we now see the fulfilled adult as the future.

Rather than philosophy, a related process can be seen in the sexualization of theology and traditional cosmology (Bharat Jhunjhunwala, [Hindu Cosmology in the Light of Modern Psychology](#), *International Journal of Theology Philosophy and Science*, 9, 2021, 5). As argued by Christine Fielder and Chris King:

Our experiential universe remains poised on a paradox, so acute, that neither the scientific description of reality, nor the religious cosmologies of history have succeeded in revealing its inner nature... We thus end up in a paradox, because neither the physical, nor the mental world description on its own can adequately describe our existential cosmology. Moreover they are complementary to one another, evoking together the complete dynamics of conscious existence in the physical world, and they are symmetry-broken in the sense that their properties are qualitatively different from one another in such a way as to comprise a complementary whole from their fundamental differences. This is the state of symmetry-broken complementation leading to paradox, we refer to as sexual paradox. ([The Cosmology of Sexual Paradox and the Fall; Sexual Paradox: complementarity, reproductive conflict and human emergence](#), 2007)

Neglect of experiential sexual attractors by mathematicians

Question to ChatGPT: The responses have responded credibly to speculative possibilities. These frame the question as to why disciplines such as mathematics are seemingly disinterested in the relevance of their insights to the dynamics of the strange attractors experienced as so fundamental to sexual attraction and courtship. Do you have any trace of relevant research

There is indeed some exploration within the mathematical and scientific communities regarding the dynamics of sexual attraction and courtship, though it is relatively sparse and highly specialized. Here are some notable examples:

- **Mathematical Toy Model:** B. Skinner explores a mathematical model to understand the trade-offs between diversity in traits and sexual dichotomization related to the origins of same-sex sexual behavior [Brian Skinner, et al, [Mathematical toy model inspired by the problem of the adaptive origins of the sexual orientation continuum](#), *Royal Society Open Science*, 2016]. This model could analogously shed light on how diverse sexual attractions are maintained within populations.
- **Mathematics of Sexual Attraction:** J. Feijó uses mathematical models to predict the nature of female attractants and male response mechanisms in plant biology, which could metaphorically relate to understanding signals and responses in human sexual dynamics [Jose A. Feijó, [The mathematics of sexual attraction](#), *Journal of Biology*, 9, 2010, 18]
- **Computational Experiments with Fuzzy Love and Romance:** Hokky Situngkir engages directly with concepts like strange attractors to model the dynamics of sexual

attraction and courtship. This approach uses mathematical frameworks to simulate human mating games and sexual preferences, potentially offering insights into the patterns and unpredictabilities of human attraction [Hokky Situngkir, [Computational Experiments With the Fuzzy Love and Romance](#), SSRN, 2007]

These examples illustrate that while the application of mathematics to the dynamics of sexual attraction and courtship is not mainstream, there are scholars who employ these tools to explore the underlying patterns and behaviors in these deeply human experiences. Such studies, although few, demonstrate the potential for mathematical and computational models to contribute to our understanding of complex interpersonal dynamics, including the enigmatic processes of attraction and relationship formation.

Question to ChatGPT: That response would appear to suggest that mathematicians have either only the most limited personal experience of sexual attraction or have little interest in what might be considered a primary driver of psychosocial dynamics -- and its implications for exponential growth in population numbers.

The perception that mathematicians have limited interest or personal experience in studying the dynamics of sexual attraction through their discipline could stem from several factors that are worth considering:

- **Scope and Focus of Mathematics:** Mathematics, as a discipline, tends to focus on abstract structures, patterns, and systems rather than the direct study of human behavior, which is typically the domain of psychology, sociology, and biology. While mathematicians certainly have the tools to model complex systems—including those involving human interaction—their primary focus is often on more abstract or theoretical problems unless specifically bridging into applied mathematics or interdisciplinary research.
- **Interdisciplinary Barriers:** The study of sexual attraction and its implications often requires a multidisciplinary approach that combines insights from biology, psychology, social science, and mathematics. While there are mathematicians who work on biological and social models, these efforts can sometimes be siloed due to traditional academic structures that separate fields. This can lead to less visibility for mathematical contributions outside of specialized studies.
- **Complexity and Variability of Human Behavior:** Human behavior, particularly aspects like sexual attraction and relationship dynamics, is highly complex and influenced by a myriad of factors that are difficult to quantify and model mathematically. While mathematics can provide models for understanding population dynamics and trends, the nuanced individual experiences of attraction and courtship might be more challenging to capture with equations and algorithms.
- **Cultural and Ethical Considerations:** The study of human sexual behavior and attraction can be sensitive, involving significant ethical and cultural considerations that may deter some researchers from engaging deeply in these areas, particularly in fields like mathematics where the direct application to personal human experiences is less common.
- **Availability of Data:** Empirical studies on sexual attraction often require detailed, personal data, which can be difficult to gather and sensitive to handle. Mathematicians might be less involved in primary data collection, relying instead on collaborations with social scientists or biologists who conduct field studies.

Despite these factors, the application of mathematical models and techniques to understand sexual attraction and its broader implications remains a valuable and intriguing area of research. As interdisciplinary collaborations become more common and data science continues to evolve, the potential for meaningful contributions from mathematics to our understanding of these complex human dynamics is likely to increase.

In this current period it can be readily argued that society is especially tortured by divisive binary dynamics. For mathematicians such dynamics have long been a focus of study, even to the point of reframing them as a trivial instance of higher dimensional dynamics -- inviting further speculation ([Towards a comprehensible encoding of higher dimensionality in sexual terms?](#) 2020; [People as Stargates: an alternative perspective on human relationships in space-time](#), 1996). &&

It is therefore curious how little insight into the transcendence of such dynamics has been rendered applicable to the social condition and especially to the many territorial disputes framed two-dimensionally (*Destabilizing Multipolar Society through Binary Decision-making*, 2016; *Neglect of Higher Dimensional Solutions to Territorial Conflicts*, 2024). This speculated on alternatives to "2-stroke democracy" suggested by 4-sided ball games -- trivial in game theory terms. It is unclear whether mathematicians (irrespective of their gender identity) have applied the insights of their discipline to the psychosocial challenges of the **LGBTQ+ community** which are now so emblematic of the limitations of binary thinking, as discussed separately (*Global Civilization through Interweaving Polyamory and Polyanimosity?* 2018).

Question to ChatGPT: There are two variants to that question and its response. The first would be the apparently limited application of mathematics to enabling human relationships such as to transcend the binary dynamics which prove so problematic -- whether individually or collectively (notably through engaging with disagreement and opposition). The second would be the ironical challenge for mathematicians -- with their highly developed understanding of limits -- in offering insights from that perspective as they personally face the process of dying and the prospect of death.

Both variants of your question delve into profound aspects of human experience and challenge mathematics to contribute beyond traditional boundaries. Let's explore each variant in turn.

- **Mathematics in Transcending Binary Dynamics in Human Relationships:** The binary dynamics often seen in human relationships—whether in interpersonal conflicts, political divides, or cultural clashes—can potentially be addressed through mathematical approaches that promote a deeper understanding of complexity and multiplicity.
 - **Game Theory:** This branch of applied mathematics examines strategic interactions where the outcomes depend on the actions of multiple agents. It could offer frameworks for understanding and navigating conflicts, negotiations, and compromises, helping parties to identify mutually beneficial outcomes rather than zero-sum game scenarios.
 - **Network Theory:** By modeling social systems as networks, mathematicians can help identify and strengthen interconnections that bridge binary divisions. Network theory can elucidate how ideas and influence flow through social groups, potentially highlighting pathways to enhance dialogue and understanding across divides.
 - **Systems Dynamics:** This approach models complex systems with feedback loops and time delays, which can be used to understand the long-term consequences of social policies or interpersonal actions. Systems dynamics might help in predicting how interventions could shift entrenched binary perspectives toward more integrated viewpoints.

These mathematical tools could contribute to designing systems, policies, or interventions that promote more nuanced interactions and help in managing disagreements in more sophisticated, informed ways.

- **Mathematicians, the Concept of Limits, and the Prospect of Death:** The mathematical concepts of limits and infinity provide a unique perspective on endings and the infinite, which can be symbolically linked to human mortality and the existential questions surrounding life and death.
 - **Philosophical Reflections:** Mathematicians, deeply familiar with the abstraction of limits, might find a unique resonance with philosophical inquiries into the human condition. The concept of approaching a limit could metaphorically reflect on how individuals approach the end of life—gradually reaching a point that might never be fully 'reached' in a finite sense.
 - **Coping with the Finite:** The mathematical comfort with dealing with finite and infinite quantities could offer a framework for understanding the finite nature of human life against the backdrop of what might be perceived as an infinite time scale or existential continuity (such as legacy, memory, or impact).
 - **Existential Data Analysis:** On a more practical level, mathematicians might apply their skills to epidemiology or gerontology, studying patterns and probabilities related to aging and mortality. Such analysis can contribute to better understanding of lifespan dynamics and the effects of various factors on longevity and quality of life.

In each case, the tools and perspectives of mathematics do not directly alter the emotional or

existential nature of human experiences but can provide a framework for understanding these experiences in different, sometimes more structured or abstract ways. This can contribute to a richer dialogue across disciplines, enhancing both the personal and collective understanding of complex human phenomena like relationships, conflict, and the universal experience of mortality.

Question to ChatGPT: Do you have any trace of instances of the application of mathematics in either case. Have mathematicians reflected on their own problematic (binary) relationships in mathematical terms. Are there reflections by mathematicians on their own demise -- again in mathematical terms

The application of mathematical concepts to personal and existential reflections by mathematicians is indeed a niche but insightful area of inquiry. Here are some instances where mathematics has been used to address binary relationships, conflict resolution, and reflections on mortality:

- Calculus of Relations: Mathematicians like D. Pous have explored the calculus of relations to understand binary relationships and decision-making processes, which includes reflections on existential matters such as one's own demise [Damien Pous, [On the Positive Calculus of Relations with Transitive Closure](#), *Symposium on Theoretical Aspects of Computer Science* (STACS 2018)]
- Pathological Mathematical Objects: J. Pogonowski discusses the role of "pathological" mathematical objects and their cognitive implications, offering a way to reflect on unexpected or paradoxical results in mathematics that could parallel the complexities of human relationships and life's unpredictability ([Pogonowski](#)) [Jerzy Pogonowski, [Domestication of Mathematical Pathologies](#), *Sciendo*, 30 December 2021]
- Problem-Solving and Mathematics: Ariana-Stanca Văcărețu notes how mathematicians utilize problem-solving views of mathematics to bridge real-life issues with abstract mathematical thinking, which could include dealing with binary conflicts and personal existential reflections [Ariana Stanca P. Vacaretu, [Reading Texts and Writing Problems to Improve Problem Solving](#), *National Council of Teachers of Mathematics*, 101, 2008, 6]
- Philosophical Reflections: Reflections on mathematical concepts and their applications beyond the natural world have been discussed by mathematicians like S. Shapiro, who explore how mathematics as a structuralist philosophy might apply to understanding reality, including personal and societal dilemmas surrounding conflict and mortality [Simon Shapiro, [Mathematics and Reality](#), *Philosophy of Science*. 50, 1983, 4]
- Historical and Philosophical Trends: The crisis in the foundations of mathematics during the turn of the 20th century led to philosophical introspections about the nature of mathematical truth, influencing thoughts on binary relationships and conceptual conflicts within mathematics itself [[Fila](#)].

These examples illustrate that while not commonplace, there is a thoughtful and deep engagement within the mathematical community about how their discipline intersects with personal and philosophical aspects of human existence. This includes the use of mathematics to understand complex relational dynamics and even the existential considerations of life and death, showcasing the broader applicability and reflective capacity of mathematical thinking.

Interaction with wormholes as framing sexual engagement for physicists?

Jessa Lingel, et al, [Black Holes as Metaphysical Silence](#), *International Journal of Communication*, 10, 2016; [ETC: A Review of General Semantics](#), 72, 2015, 4)

In a brilliantly mischievous interview with *Spiegel*, Italian author and theorist Umberto Eco argued that human fear of the infinite (which is to say, of death) is assuaged by lists, a gesture of imposing order on that which extends forever, beyond human knowing [S. Beyer and L. Gorris, [Spiegel interview with Umberto Eco](#), 2009]. Science fiction is also a means of imposing order—via narrative—on the infinite, of projecting possible futures to come to terms with and critique the present. Perhaps no trope of science fiction is as invested in coping with infinitude as the black hole, which I will read as moments where science fiction sequesters its own attempts at explanation and conjecture, naming an unknown thing or process or phenomenon as

fundamentally inexplicable, as literally beyond the known. Black holes are certainly confrontations with the infinite and with death (wormholes, arguably, are more of an evasion... More than merely a confrontation with death, black holes and wormholes are confrontations with narrative, articulating the boundaries of the explicable.

In a response, [Aram Sinnreich](#) argues:

It's amazing to me... that the profound Freudian dimension of the black hole has thus far been overlooked. It may well be a coincidence that Freud's theories concerning sexuality and symbolism were developed at the same time that his Austrian neighbor Albert Einstein was tackling general relativity; either way, the resonances between the two modes of inquiry -- one inward, the other outward -- are considerable. Let's not put too fine a point on it: The black hole is a vagina. There may be a handful of physicists and mathematicians who are capable of understanding the nature of this physical phenomenon at a level of granularity and accuracy that renders metaphor irrelevant, but for the rest of us, symbolism will have to suffice. And, for better or for worse, it is a symbol we all recognize without having to reach too far into the depths of our unconscious, a symbol that is central to nearly every system of signification known to scholarship. The big O.

This is not to say that black holes, or yonic symbology, broadly speaking, carry the same affective potential, or the same set of cognitive associations, for every person, or even within each theoretical framework. According to Freudian psychoanalysis, the sight of the vagina is sufficient to produce castration anxiety in very young boys, at the phallic stage of psychosexual development, with psychological consequences throughout the duration of a man's life. Thus, the black hole as a symbol carries the capacity to trigger profound emotional responses in male adults, such as feelings of inadequacy and guilt associated with the man's sublimated sexual desire for his own mother...

All of which brings us back to black holes and vaginas. If we take the one to signify the other, in most or all science-fiction narratives, then Jessa's analysis would suggest that most science fiction still conforms to a Freudian interpretive framework. If the black hole operates structurally as a caesura, a symbol of what isn't symbolized, and narratively as a silent threat, a gaping maw in space-time waiting to swallow heroic wanderers, then by association female sexuality still operates as a foil for male desire and fear. Even in its wormhole modality, the black hole still serves as a receptacle, or a medium, for male intentionality. *[emphasis added]*

Question to ChatGPT: The subtle insights of theoretical physicists and astrophysicists with regard to wormholes and black holes could be understood as their efforts to objectify their subjective experience of sexual attraction and intercourse. Could current speculation on travel through a wormhole to another universe then be interpreted in terms of the cognitive transformation associated with sexual consummation. More mysterious is any interpretation of falling into a black hole

The metaphorical application of concepts like wormholes and black holes to describe experiences of sexual attraction and consummation is intriguing and resonates with the way theoretical physicists and astrophysicists explore profound and often abstract phenomena. This perspective allows for a poetic interpretation of the cognitive and emotional transformations that accompany deep, intimate connections, likening them to the mysterious and transformative journeys described in modern physics.

- **Wormholes and Cognitive Transformation:** Wormholes in physics are theoretical passages through spacetime that could connect disparate points in the universe, or possibly even different universes. Applying this metaphor to human experiences, especially sexual consummation, can symbolize the profound cognitive and emotional journey that occurs when deeply connecting with another person:

Interdimensional Travel: Just as a wormhole suggests travel between different realms or universes, sexual consummation might be seen as a journey into a new and profoundly different emotional or relational state. This transition can dramatically transform one's perception of self and others, akin to entering a new universe of understanding and connection.

- Cognitive Shifts: The experience of intimacy can lead to significant shifts in cognition and perception. The intense emotional and physical connection can feel like moving through a portal that changes how individuals perceive their relationships and themselves, potentially reshaping their emotional landscape.
- Black Holes and the Experience of Falling In: Black holes are regions of spacetime exhibiting such strong gravitational effects that nothing—not even particles and electromagnetic radiation such as light—can escape from inside it. The metaphor of falling into a black hole can be richly evocative when considering the overwhelming and all-consuming nature of some romantic or sexual experiences:
 - Event Horizon: Just as the event horizon of a black hole represents a point of no return, entering into a deeply consuming relationship or emotional state can feel like crossing a boundary after which everything fundamentally changes. The individual may feel that their previous ways of living or understanding are irretrievably altered.
 - Singularity: At the center of a black hole lies the singularity, a point where traditional laws of physics break down. This could be likened to the transformative or sometimes disorienting impact of deep passion or love, where normal expectations and emotional responses no longer apply, and one's sense of self may feel profoundly altered or intensified.
 - Isolation and Absorption: The profound isolation of a black hole, where no light escapes, might mirror the intensely private and isolated nature of deep romantic bonds, where the outside world seems to fade away in the intensity of the shared experience.
- Philosophical and Psychological Implications: The use of these cosmic metaphors not only enriches our poetic and metaphorical language but also offers a way to articulate the often ineffable experiences associated with deep human relationships. In philosophy and psychology, such metaphors can help individuals express and explore their feelings in new ways, providing fresh insights into the nature of human emotion and connection.

By engaging with these metaphors, both individuals and theorists can explore the complexities of human experiences—such as attraction, love, and consummation—through a fresh lens that combines the wonders of cosmic phenomena with the depths of human emotion. This approach fosters a broader appreciation of how deeply transformative intimate human experiences can be, paralleling the awe-inspiring and mysterious nature of the universe as understood through physics.

Question to ChatGPT: That insightful response could be further extended metaphorically in the light of speculation by some astrophysicists with regard to the manner in which black holes (and possibly wormholes) are interconnected -- as with references to "black hole network". Does this potentially imply a higher order of intersubjective connectivity relevant to any understanding of collective human identity and collective consciousness

The metaphorical extension of black holes and wormholes to a "black hole network" offers a fascinating avenue for exploring concepts of intersubjective connectivity, collective human identity, and collective consciousness. This idea can enrich our understanding of how deeply interconnected yet seemingly isolated personal experiences contribute to a broader collective experience.

- Black Hole Network and Intersubjective Connectivity: Astrophysical concepts like a network of black holes, potentially linked by wormholes, suggest a complex, underlying structure connecting areas that seem, on the surface, to be entirely isolated. Translating this into a metaphor for human consciousness and social connectivity:
 - Hidden Connections: Just as black holes might be interconnected by wormholes in speculative astrophysics, humans might be interconnected through unseen, yet profound, emotional, psychological, and existential links. These connections could form a network that underpins collective experiences and identities, even if on the surface individuals feel isolated or discrete.
 - Transmission of Information and Influence: If wormholes can allow for the

passage of information between black holes, this could be analogous to ways in which deeply personal experiences—like those of love, passion, or transformation—are shared and understood across human society. Cultural artifacts, storytelling, and empathetic communication might serve as the "wormholes," facilitating the transfer of these intensely personal experiences into the collective consciousness.

- Non-locality and Entanglement: Borrowing from quantum mechanics, where entangled particles affect each other's state instantaneously over any distance, similar entanglement could exist in human relationships and consciousness. Emotional or psychological states might resonate across the human network, influencing others in subtle, profound ways that transcend traditional communicative or spatial limitations.
- Collective Human Identity and Consciousness: This conceptual framework could be particularly useful in understanding the dynamics of collective human identity and consciousness:
 - Collective Identity: Just as a network of black holes forms a larger structure with properties that cannot be attributed to any single black hole, the collective human identity may emerge from interconnected personal identities and experiences. This network of experiences and shared narratives forms the bedrock of cultural and social identity, transcending individual contributions.
 - Collective Consciousness: The idea of a black hole network could also illustrate how collective consciousness emerges—a shared knowledge pool that includes common beliefs, values, and understandings that link individuals together into a cohesive social or cultural entity. These shared elements are continuously shaped by the intersubjective connectivity of individual experiences, much like the way energy and matter might hypothetically flow between black holes.
- Philosophical and Social Implications: This metaphor can deepen our philosophical and social discourse by suggesting that:
 - Understanding and empathy might be more deeply woven into the fabric of human society than previously recognized.
 - Social and cultural cohesion may rely on these hidden, yet powerful, intersubjective connections that draw seemingly disparate experiences into a unified narrative.

Exploring these metaphors not only enriches our conceptual understanding but also provides a valuable framework for addressing contemporary issues of alienation and fragmentation in society. It suggests that even in our deepest isolation, there may be unseen connections that bind us to the collective human experience, offering a potential path toward greater unity and understanding.

Mathematics of death and dying as an engagement with limits?

In a period in which ever increasing consideration is given to enabling the death of enemies, whilst inhibiting the increasing number of suicides and the process of voluntary euthanasia, it is intriguing to note the challenge faced by the military (as an epitome of objectivity) with the surprising proportion of veteran suicides -- reacting subjectively to their experience in the field ([United States military veteran suicide](#)). [Wikipedia](#) offers one checklist of 17 [mathematicians who committed suicide](#), with [another](#) on [DuckDuckGo](#). One explanation is offered ([Why many famous Western mathematicians end up committing suicide, destitute and mad?](#) [Yahoo Answers](#))

A separate exploration of [Metaphors To Die By](#) (2018) considered correspondences between a collapsing civilization, culture or group, and a dying person. That included discussion of [Mathematical cosmology and death](#) and [Mathematical cosmology -- improving the inner game of dying](#). That discussion noted that cultures, such as that of mathematicians, are typically much challenged to imagine the nature of their own death -- consistent with the arguments of Karen A. Cerulo ([Never Saw It Coming: cultural challenges to envisioning the worst](#), 2006).

In anticipation of death, the monastic discipline of Zen is exceptional in its tradition of haiku [death poems](#). Reuben Hersh has however published [Death and Mathematics Poems](#) ([The Mathematical Intelligencer](#), 35, 2013, 1). The interest of mathematicians in death would otherwise seem to be limited to the objective importance of [mortality statistics](#) in actuarial and other studies (Robert Krulwich, [Nature has a formula](#)

[that tells us when it's time to die](#), 22 January 2013). There are some exceptional perspectives ([Mark Kruse](#), *Death and the Higgs Boson: talking mortality with a physicist*, *DigitalDying*, 1 December 2013; [Aaron Freeman](#), *Eulogy from a Physicist*, *Daily Kos*, 28 April 2013).

Ironically the self-referential possibility of mathematics itself dying has been explored as a primary concern by several mathematicians -- but not with the aid of mathematics ([Keith Devlin](#), *The Death of Mathematics*, *Edge*, 2013; [Gary Rubinstein](#), *The Death of Math*, 19 October 2013). There is also concern by mathematicians with the "death" of one of its fundamental processes ([John Horgan](#), *The Death of Proof*, *Scientific American*, October 1993). A possible exception to the trend focuses on the birth and death of mathematical concepts ([Charles S. Fisher](#), *The Death of a Mathematical Theory: a study in the sociology of knowledge*, *Archive for History of Exact Sciences*, 3, 1966, 2, pp. 137-159; [Gavin Hitchcock](#), 'Good Death': a common pattern in the evolution of mathematics, science and biological organisms, *Science and Christian Belief*, 23, 2011, 2, pp. 115-132).

More personally, there is the question of how to manage diminishing memory and cognitive functions fruitfully? By, or through, what metaphors can one most meaningfully die as a mathematician -- or as a mathematically informed civilization? Do mathematicians and cosmologists "die well"? If not, why not? How might a mathematician frame the experience ("depression") leading to to a suicidal decision?

Wikipedia records elements of the suicide note of one of them, [Yutaka Taniyama](#):

As to the cause of my suicide, I don't quite understand it myself, but it is not the result of a particular incident, nor of a specific matter. Merely may I say, I am in the frame of mind that I lost confidence in my future.

[Paul Ehrenfest](#), a physicist who helped in the development of general relativity and was a close friend of Albert Einstein, committed suicide in 1933. Ironically suicide figures in an unusual thought experiment ([Josh Clark](#), *How Quantum Suicide Works*, *How Stuff Works*).

Question to ChatGPT: Following the indications of *The Limits to Growth* (1972) and *Collapse: How Societies Choose to Fail or Succeed* (2011) -- and irrespective of the citations presented earlier -- how might an individual, group or civilization frame its own demise in mathematical terms.

Framing the demise of an individual, group, or civilization in mathematical terms can provide a structured and predictive perspective on processes that might otherwise seem overwhelmingly complex or driven by intangible factors. Drawing insights from works like "The Limits to Growth" (1972) and "Collapse: How Societies Choose to Fail or Succeed" (2011), mathematical models can help in understanding the dynamics that lead to collapse and can also inform strategies to mitigate such outcomes. Here's how these concepts can be mathematically framed:

- **Exponential Growth and Carrying Capacity:** Exponential growth models are frequently used in ecology to predict population dynamics. When applied to civilizations, these models can illustrate how unsustainable growth, if unchecked, leads rapidly to overexploitation of resources.
 - Equation: The basic form $P(t) = P_0 e^{rt}$, where $P(t)$ is the population at time t , P_0 is the initial population, r is the rate of growth, and e is the base of the natural logarithm, demonstrates how populations expand exponentially unless constrained.
 - Application: In the context of societal collapse, this model can show how resource demand might outstrip supply, leading to a crash when the ecological carrying capacity is exceeded.
- **Logistic Growth and Limits:** Logistic growth models adjust exponential growth to include limits to growth, introducing the concept of carrying capacity of the environment, which is the maximum population size that the environment can sustain indefinitely.
 - Equation: $P(t) = \frac{K}{1 + e^{-r(t-t_0)}}$, where K is the carrying capacity.
 - Application: This model is particularly relevant to "The Limits to Growth" scenario, as it provides a way to calculate how close a civilization is to reaching the limits of its environment's capacity before growth is curtailed and decline begins.
- **Systems Dynamics Models:** Systems dynamics models involve complex feedback loops and time delays, integrating various factors like technology, economy, environment,

and policies to simulate how they interact over time.

- Framework: Using software like Stella or Vensim, these models can simulate the interactions of growth, resource depletion, pollution, and societal responses.
- Application: Such models can help policymakers and civilizations understand potential future scenarios, including collapse, based on current trajectories and interventions.
- Differential Equations and Resource Depletion: Using differential equations to model the rate of change in resource availability and consumption can provide insights into how quickly a society might deplete its resources relative to its consumption patterns.
 - Equation: $\frac{dR}{dt} = R - cR$, where R is the resource amount, t is time, and c is the consumption rate.
 - Application: This model helps in understanding the depletion of critical resources like water, energy, or minerals, indicating when a civilization may face critical shortages leading to potential collapse.
- Network Theory in Social Collapse: Network theory can be applied to understand the resilience or fragility of social structures. It examines how connections between entities (individuals, organizations, or nations) facilitate or hinder the flow of resources and information.
 - Analysis: Analyzing the robustness of networks or the impact of removing key nodes can illustrate potential points of failure that might precipitate wider social collapse.
 - Application: In a civilization, weak or overly centralized networks might suggest vulnerability to collapse if key nodes fail (e.g., major infrastructure, leadership, or critical supply chains).

By utilizing these mathematical frameworks, individuals, groups, and civilizations can not only frame their potential demise in clear terms but also identify intervention points that might mitigate or redirect these paths towards more sustainable futures. This approach underscores the power of mathematical modeling in making abstract or long-term threats more tangible and actionable.

In quest of a complementary perspective to that of *The Limits to Growth*, an early exercise focused on psychodynamics (*World Dynamics and Psychodynamics*, 1971). This was understood as a step towards making abstract "world system" dynamic limitations meaningful to the individual.

Question to ChatGPT: Whilst reasonable in its objectivity, that response avoids the probability that a mathematician considering suicide would tend to reframe such articulations metaphorically -- perhaps with reference to chaos theory and the subjective experience of being "overwhelmed". Can you speculate on a metaphorical reframing of the distinctions you present.

Certainly, reframing the mathematical concepts of societal or individual collapse through a metaphorical lens, especially in the context of a mathematician contemplating the profound decision of suicide, invites a deeply subjective and humanistic interpretation of these theories. Let's explore how chaos theory and the feeling of being "overwhelmed" might metaphorically describe these dynamics:

- Exponential and Logistic Growth: The Escalating Spiral: Consider the imagery of an escalating spiral, much like a graph of exponential growth that suddenly encounters the ceiling of logistic restraint. This spiral could symbolize the internal escalation of thoughts and emotions in an individual contemplating suicide—a rapid, dizzying increase in intensity that suddenly finds itself confined by external realities or internal limitations, creating a sense of being trapped or suffocated.
- Systems Dynamics: The Web of Feedback Loops: Visualize a web, intricate and delicate, with each thread representing different aspects of life—social connections, personal achievements, failures, and fears. In systems dynamics, these are feedback loops where one thread vibrates and sends ripples across the entire network. For someone feeling overwhelmed, this web can become a snare, where movements in one part of life reverberate uncontrollably through others, making the entire system feel unpredictable and confining.
- Differential Equations and Resource Depletion: Draining Sands: Imagine standing in an hourglass, watching sand—the very ground beneath you—drain away. Each grain represents vital resources such as emotional energy, hope, or physical health. The rate of depletion is a differential equation where the loss accelerates, potentially leading to a point

of no return. The feeling of sand slipping away uncontrollably can parallel the despair and helplessness that might precede a crisis decision like suicide.

- **Network Theory: The Fractured Net:** Picture a net, each node connected by resilient yet fragile threads. In the context of overwhelming stress or despair, the net represents one's social and psychological support system. The fracturing of this net—when critical nodes (supportive relationships, mental health resources) are lost or weakened—can lead to a feeling of falling, with no safety net below to catch the fall.
- **Chaos Theory: The Butterfly Effect:** Chaos theory often refers to the butterfly effect, where small, seemingly insignificant actions can lead to vast, unpredictable consequences. For an individual battling overwhelming thoughts, this metaphor captures how minute fluctuations in their mental state can have disproportionately large impacts on their decisions and feelings, leading to a chaotic and uncontrollable trajectory that might culminate in the contemplation of suicide.

These metaphors serve not only to humanize the mathematical models but also to articulate the intense, often chaotic internal experiences associated with profound psychological distress. By using these metaphorical framings, we can better empathize with the subjective experiences behind the objective data, bringing a richer, more compassionate understanding to discussions of such serious personal crises.

Question to ChatGPT: Given that so many esteemed mathematicians have been acknowledged as people of faith (associating their creative efforts in that regard), it is appropriate to inquire how mathematical insight has been elaborated to envision heaven, an after life, or life eternal -- potentially beyond the framework of mathematical theology

Mathematicians have historically integrated their mathematical insights into concepts like heaven, an afterlife, or eternal life in various imaginative and profound ways, often intertwining their mathematical reasoning with philosophical and theological considerations:

- **Theological Metaphors in Mathematics:** Some mathematicians have used theological metaphors such as "God's view" to describe infinite processes and divine-like or super-human powers, reflecting on the grand scale and the mystical aspects of mathematical concepts, particularly in the context of infinity and eternal truths [Stanisław Krajewski, [Theological Metaphors in Mathematics](#), *Sciendo*, 17 March 2016]
- **Philosophy and Theology Interplay:** Integrating mathematical insights with philosophical and theological musings, mathematicians like Leibniz have tackled profound issues related to truth, cosmology, and the mysteries of infinity, often pondering over concepts that bridge the mathematical with the divine [James Bradley, [Theology and Mathematics: An Introduction](#), *Theology and Science*, 9, 2011, 1]
- **Platonist Views and the World of Ideas:** Reflecting a Platonist perspective, some mathematicians envision a 'world of ideas' where mathematical objects exist, akin to an abstract heaven. This perspective supports the notion that mathematics, much like theology, deals with universal truths that transcend our physical reality, offering a structured yet mystical exploration of concepts that could parallel an afterlife or eternal existence [M. Marcolli]
- **Mathematicians and Their Gods:** Exploring the personal faiths of mathematicians, some have integrated their insights with their religious beliefs, using their understanding of mathematics to make sense of and describe their visions of an afterlife or eternal life, suggesting that their mathematical pursuits also served as a spiritual journey [Charlotte Methuen, [The German Reformation and the Mathematization of the Created World](#), *Theology and Science*, 9, 2011, 1].
- **Infinity and Eternal Life:** The concept of infinity in mathematics often leads to reflections on eternal life, with the infinite processes and unbounded growth models providing a metaphorical framework for envisioning life beyond the physical confines of the world, suggesting a form of existence that continues beyond known limits.

These examples demonstrate that throughout history, mathematicians have not only engaged with abstract and empirical problems but have also ventured into metaphysical realms, using their mathematical insights to explore and conceptualize notions of heaven, the afterlife, and eternal life. These endeavors highlight the deeply human aspect of mathematical exploration, where the search for truth transcends the empirical and taps into the existential and spiritual.

Renaissance and its "sexual" implication for mathematicians?

Question to ChatGPT: In a period in which there is anticipation of some form of saviour for civilization, whether technical or otherwise, could you speculate on how AI might assist in reframing the subjective prospect of any form of collapse or demise -- enabling people to think otherwise about the prospect and any renaissance

As we navigate a period of global uncertainty and the anticipation of transformative changes, artificial intelligence (AI) can play a pivotal role in helping societies rethink and reframe the potential for collapse or demise, as well as the possibilities for renewal or renaissance. Here's how AI could assist in reshaping our perspectives and strategies:

- **Predictive Analytics and Scenario Planning:** AI can analyze vast amounts of data to predict potential futures and model different scenarios. By using machine learning algorithms and systems dynamics models, AI can help forecast long-term outcomes based on current trends. This capability can be instrumental in:
 - **Identifying Risks:** AI can detect emerging threats that might not be visible to human analysts, such as subtle environmental changes, economic shifts, or social trends.
 - **Optimizing Strategies:** By simulating different policy interventions or technological innovations, AI can help determine which strategies might effectively avert potential collapses or foster a renaissance in various sectors.
- **Enhancing Collective Intelligence:** AI can facilitate better decision-making by integrating diverse perspectives and expertise, thus enhancing the collective intelligence of communities or organizations. Tools like collaborative AI platforms can bring together stakeholders from different backgrounds to brainstorm solutions, creating a more inclusive and comprehensive approach to problem-solving.
 - **Crowdsourcing Solutions:** AI can help synthesize ideas from a global crowd, offering a platform for innovative solutions that might not emerge within traditional hierarchies or silos.
 - **Balancing Biases:** By providing data-driven insights, AI can help balance human biases in decision-making processes, encouraging a more objective approach to evaluating risks and opportunities.
- **Emotional and Psychological Support:** AI technologies, including chatbots and virtual assistants, can provide emotional and psychological support to individuals facing uncertainty about the future. By delivering personalized advice and support, AI can help mitigate anxiety and stress related to potential societal changes or personal circumstances.
 - **Mental Health Applications:** AI-driven mental health tools can offer early detection of stress or depression symptoms and provide therapeutic interactions, helping individuals cope with fears about the future.
 - **Educational Tools:** AI can deliver customized educational content to help individuals understand complex global dynamics, empowering them with knowledge to actively participate in shaping their futures.
- **Fostering Resilience through Community Engagement:** AI can aid in building resilient communities by facilitating communication, coordination, and resource allocation. It can ensure that communities are better prepared for disruptions and more capable of initiating grassroots responses to crises.
 - **Resource Distribution:** AI can optimize the distribution of resources in crisis scenarios, ensuring that help reaches those in need efficiently.
 - **Community Networks:** AI can help create and maintain networks of communities, enhancing social cohesion and collaborative resilience efforts.
- **Redefining Human Potential and Creativity:** As AI takes over routine and computational tasks, it can free humans to engage in more creative and interpersonal activities, potentially leading to a renaissance in arts, sciences, and humanities. This shift could redefine human roles in society, emphasizing innovation and creative problem-solving.
 - **Creative Collaboration:** AI can assist in artistic and scientific endeavors, providing tools that extend human capabilities and foster new forms of creative expression.

Educational Transformation: AI-driven personalized learning could revolutionize education, making it more accessible and tailored to individual strengths and interests.

By leveraging AI in these ways, we can potentially transform the anticipation of collapse or demise into proactive strategies for prevention and renewal. AI not only offers tools for analysis and problem-solving but also enables a broader and more empowered engagement with the challenges and opportunities of the future, encouraging a collective effort towards a sustainable and thriving civilization.

Question to ChatGPT: Whilst indeed reasonable, that speculative response emphasizes the ability for AI to enable objective responses to the prospect, the question was rather how AI might enable more fruitful subjective responses, potentially through the elaboration of new metaphors, for example

Focusing on how AI can foster fruitful subjective responses and assist in generating new metaphors provides a compelling perspective on managing the emotional and psychological aspects of societal change. AI can act as a catalyst for reframing narratives about collapse, renewal, and the future of civilization in ways that resonate on a personal level. Here's how AI might aid in this transformative process:

- **Generating New Metaphors and Narratives:** AI's capability to process and analyze vast datasets, including cultural, historical, and social media content, allows it to identify and create meaningful metaphors that resonate with diverse audiences. These metaphors can help people conceptualize complex scenarios related to societal changes in more accessible and relatable terms.
 - **Metaphor Creation:** AI can use natural language processing to develop metaphors that connect technological or ecological changes to familiar everyday experiences. For example, comparing the adaptation to climate change to the metamorphosis of a caterpillar into a butterfly, suggesting a transformative and hopeful change rather than an apocalyptic end.
 - **Storytelling:** AI can craft stories that embed these metaphors within narrative frameworks, making the abstract concepts of societal change, collapse, or renewal tangible and emotionally impactful.
- **Enhancing Artistic Expression:** AI can collaborate with artists, writers, and filmmakers to explore new forms of expression that capture the human experience of facing and adapting to change. By combining AI's analytical capabilities with human creativity, new genres of art and literature can emerge that reflect contemporary challenges and aspirations.
 - **Interactive Art:** AI-driven interactive installations could allow participants to visually and physically experience simulations of future scenarios, adjusting the narrative based on their reactions and decisions.
 - **Film and Literature:** AI could help scriptwriters and authors to develop plots and characters that embody the psychological and emotional journeys of individuals and communities navigating through times of crisis and transformation.
- **Facilitating Emotional Resonance through Personalization:** AI can personalize the delivery of content and interactions based on individual psychological profiles, cultural backgrounds, and personal histories, making the engagement deeply relevant and emotionally resonant.
 - **Personalized Learning:** AI can tailor educational content about global challenges and potential futures to align with an individual's values, fears, and hopes, making the learning experience more impactful and personally transformative.
 - **Emotionally Intelligent Interfaces:** AI systems with emotional intelligence can interact with users in a way that acknowledges their feelings and provides support or insights tailored to their emotional state, facilitating a more nuanced engagement with complex issues.
- **Creating Virtual Experiences and Simulations:** AI can create detailed simulations and virtual reality experiences that allow individuals to "live" potential future scenarios, making the abstract concept of societal changes more immediate and experientially real.
 - **Virtual Reality (VR) Simulations:** Through VR, individuals can experience the potential consequences of ecological collapse or the benefits of sustainable living practices in a visceral way, helping to transform attitudes and behaviors through immersive experience rather than through abstract understanding.

Building Community and Dialogue: AI can help build virtual and real-world communities where these new metaphors and narratives are discussed and evolved. By facilitating dialogue across diverse groups, AI can help forge a shared understanding and collective narratives that empower communities.

- Online Platforms: AI can moderate and guide discussions on online platforms, ensuring that they are inclusive and constructive, and helping to synthesize collective insights into coherent narratives that support a sense of agency and possibility.

By employing these strategies, AI can play a crucial role in enabling more fruitful subjective responses to societal challenges, helping individuals and communities envision and move towards a hopeful future through the power of new metaphors and personalized engagement.

The possibility of renewal, following any form of collapse, currently invites optimistic interpretation in terms of "renaissance" -- with its sexual connotations (*Challenges of Renaissance: suggestive pattern of concerns in the light of the birth metaphor*, 2003; *Post-Apocalyptic Renaissance of Global Civilization: engaging with otherness otherwise?* 2018)

Question to ChatGPT: Given the manner in which the prospect of renewal tends to be framed in terms of "renaissance", and the sexual implications of that metaphor, a question is how mathematicians can reframe their recognition of creativity with such experiential implications. Any reference to renewal is consistent with the extensive mathematical insight into cycles, although their subjective implication for mathematicians is far less evident

The concept of "renaissance," commonly associated with renewal and rebirth, carries both cultural and, implicitly, sexual connotations of creativity and new beginnings. This metaphor can indeed be enlightening when considering how mathematicians view their own cycles of creative renewal in their work. The connection between mathematical cycles and personal experiences of renewal or creativity, while not often explicitly discussed, offers a rich terrain for exploration. Here's how mathematicians might reframe their recognition of creativity, drawing from both the metaphor of a renaissance and the mathematical insight into cycles:

- Cyclic Nature of Mathematical Discoveries
 - Periodicity in Mathematical Research: Just as in nature, where cyclic processes like seasons or life cycles dominate, mathematics too experiences periods of intense activity followed by times of reflection and lesser activity. Mathematicians might find parallels in their work cycles to these natural rhythms, understanding that times of lesser productivity are not stagnant but rather times of germination for future discoveries.
 - Cycles of Conjecture and Proof: The process of developing mathematical theories often involves cycles of conjecture, testing, and proof, which can be seen as a cycle of intellectual rebirth. Each solved conjecture or theorem paves the way for new questions, driving the perpetual motion of mathematical exploration.
- Mathematical Renaissance as a Personal Journey
 - Creative Breakthroughs as Renaissance: Every major breakthrough in a mathematician's career can be viewed as a renaissance—a rebirth of ideas and approaches. Recognizing these pivotal moments could be framed sexually in terms of the generative, life-giving nature of new insights and the rejuvenation they bring to the mathematician's intellectual life.
 - Phases of Learning and Relearning: The lifelong learning trajectory of a mathematician involves continually revisiting and expanding upon old ideas, often leading to new insights from established knowledge. This process can be likened to a renaissance, where revisiting past 'lives' of ideas brings forth new intellectual 'offspring' or breakthroughs.
- Integration of Personal Experience with Mathematical Insight
 - Mathematics of Personal Growth: Mathematicians might use mathematical models to metaphorically represent their own personal and professional growth. Concepts like fractals could symbolize the ever-expanding complexity of their understanding and creativity, while dynamical systems might model shifts in their career or research focus.
 - The Emotional Cycle of Mathematical Work: Just as there are emotional

undercurrents in the phases of a renaissance, mathematicians experience highs of discovery and lows of frustration or stagnation. Acknowledging this emotional cycle can help in normalizing the ups and downs of creative work, framing them as necessary for the maturation of ideas and personal growth.

- Broader Implications of Cyclic Renewal
 - Teaching as Renewal: The act of teaching can be a form of creative renewal for mathematicians, where imparting knowledge to new generations revitalizes old concepts, often leading to new insights as fresh perspectives are introduced by students.
 - Collaboration and Interdisciplinary Renaissance: Engaging with other fields can spur a renaissance by injecting new ideas and methods into mathematics, reminiscent of the historical Renaissance's blend of art, science, and humanism. This interdisciplinary approach can mimic the regenerative aspects of cross-fertilization seen in biological cycles.

In these ways, mathematicians can reconceptualize their engagement with mathematics not just as a pursuit of knowledge but also as a deeply personal and cyclic journey of renewal and creativity. This reframing could enrich their understanding of their work's impact on their personal lives and vice versa, integrating the cognitive and experiential aspects of their careers in a holistic manner.

Question to ChatGPT: Earlier in this exchange it was suggested that wormholes and black holes could be explored metaphorically as framing sexual engagement in the imagination of physicists. The speculative question is how such a metaphor (given its provocative connotations) could be related to that of renaissance and renewal -- whether for a global civilization or an individual.

Integrating the metaphors of wormholes and black holes with the concepts of renaissance and renewal offers a rich, multi-layered way to think about transformation, whether in the context of individual lives or global civilization. These astrophysical phenomena can provide vivid imagery for describing profound changes, transitions, and rebirths.

- Wormholes: Pathways to Renaissance: Wormholes in physics are theoretical tunnels through spacetime that can connect extremely distant points in the universe instantaneously. Metaphorically, these can symbolize rapid or transformative shifts that allow for bypassing traditional paths or barriers, akin to sudden breakthroughs or leaps in understanding that lead to a renaissance:
 - Individual Renaissance: For an individual, a wormhole could represent a life-changing experience or insight that rapidly transports them from one state of being to another, fundamentally altering their perspective or life path. This could be a new career, a transformative relationship, or a sudden realization that changes one's life direction.
 - Civilizational Renaissance: For global civilization, wormholes could metaphorize breakthrough technologies or ideas that radically alter the societal structure, such as the internet or renewable energy technologies. These innovations act as tunnels that propel society quickly into new eras of understanding and functioning, potentially solving critical issues or enabling more sustainable lifestyles.
- Black Holes: Consuming the Old to Birth the New: Black holes are regions in space where the gravitational pull is so strong that nothing, not even light, can escape. While often viewed as destructive, black holes can also be seen as areas of intense consolidation and transformation of matter and energy:
 - Individual Transformation: On a personal level, black holes can metaphorically represent periods of intense personal challenge or introspection where an individual feels consumed by their circumstances. However, just as some theories suggest that what enters a black hole might emerge in a transformed state elsewhere, these challenging periods can lead to profound personal growth and renewal, where old parts of the self are stripped away to reveal new aspects.
 - Civilizational Renewal: For civilization, black holes could represent societal or environmental crises that force a compression of resources and necessitate radical shifts in how societies function. The 'pressure' of these crises could lead to a consolidation of will, resources, and innovation, catalyzing significant changes that could rebirth the civilization in a more sustainable and enlightened form.

- Synthesis with Renaissance and Renewal: Combining these metaphors, the journey through a wormhole or the transformation at the edge of a black hole can mirror the process of renaissance and renewal, where old forms and ideas are either rapidly transitioned into new states or intensely transformed to emerge anew. In both cases, the focus is on the emergence from these processes:
 - Renaissance as Emergence: Whether it's emerging from a wormhole into a new universe of ideas or being reborn from the transformative pressure of a black hole, the concept of renaissance involves a rebirth into states of greater understanding, capability, or harmony.
 - Renewal as Continuous Cycle: Just as the universe is thought to possibly cycle through expansions and contractions, human civilizations and individuals might also be seen as undergoing continuous cycles of growth, collapse, and renewal, always emerging from the 'event horizon' of their experiences renewed and transformed.

These metaphors provide powerful imagery for discussing personal and societal change, suggesting that even the most challenging or isolating experiences (black holes) or the most revolutionary leaps (wormholes) are part of the broader processes of growth and renewal inherent in the concept of a renaissance. They encourage a perspective that values transformation and posits that from the depths of challenge or the leaps of innovation, new beginnings can and do emerge.

Reference is made to the variously anticipated collapse by Stan Cox ([Eco-Collapse Hasn't Happened Yet, But You Can See It Coming](#), *CounterPunch*, 30 April 2024). This notes the recently updated simulation of *The Limits to Growth* model with a sobering concluding remark:

As a society, we have to admit that, despite 50 years of knowledge about the dynamics of the collapse of our life support systems, we have failed to initiate a systematic change to prevent this collapse. It is becoming increasingly clear that, despite technological advances, the change needed to put us on a different trajectory will also require a change in belief systems, mindsets, and the way we organize our society. (Arjuna Nebel, et al, [Recalibration of Limits to Growth: an update of the World3 model](#), *Journal of Industrial Ecology*, 28, 2024, 1)

Any such surprise at the lack of action on the matter over 50 years could be curiously matched by surprise at the failure to "recalibrate" the model in the light of any parameter indicative of such systemic negligence as a psychosocial phenomenon ([Variety of System Failures Engendered by Negligent Distinctions](#), 2016). This could be understood as a feature of "silo mentality", as previously discussed ([Modelling silo thinking and resistance to integrative perspectives](#); [Modelling strategic avoidance under conditions of uncertainty](#), 2024). With civilization effectively falling into a "black hole", such a hole merits exploration as significantly sustained by a silo mentality ([Reframing psychosocial silos as "black holes" of communication space?](#) 2024).

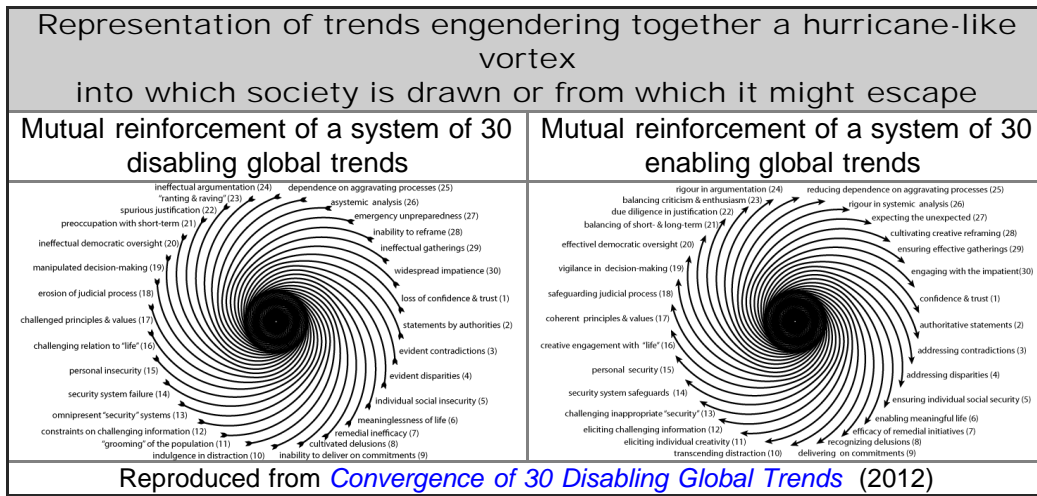
The event horizon characteristic of an astrophysical black hole, and the manner in which communication flows are distorted, invites a comparison between silo thinking and ADHD ([Attention deficit hyperactivity disorder](#)). Silo dynamics are readily recognized as hyperactive, if only in response to the 24/7 news cycle. Their attention deficiency is readily recognized in response to domains beyond their mandate.

Visualization of the vortical challenge for civilization

Whether as a wormhole or a black hole, the dynamics are explored by physics as a [vortex](#) -- a swirling attractor familiar in whirlpools and tornadoes. As a metaphor it is understood as a dangerous or bad situation in which one becomes progressively more involved and from which one cannot escape. As such it accords with the experience of financial black holes -- and the public debt of many countries.

The question is whether the conception and design of global models by mathematicians should "conform" in some way to the helical forms through which they are framed in nature, as discussed separately ([Conformality of global modelling to cognitive appreciation of crises?](#) 2021). This contrasts with other approaches to any mind map of potential civilizational collapse ([Mind Map of Global](#)

Civilizational Collapse: why nothing is happening in response to global challenges, 2010). The spiralling characteristic recognized in crises of crises -- if only experientially -- then suggests depictions such as the following in anticipation of any "perfect storm", reproduced from a detailed discussion with related animations (*Convergence of 30 Disabling Global Trends: mapping the social climate change engendering a perfect storm*, 2012).



Curiously it is René Descartes who discussed from 1633 the role of vortex energy as fundamental to the universe; more curiously this corresponds to [Dreamtime](#) depictions of Aboriginal Australians (I. J. Ikävalkom, *Vortex of Descartes: Cartesian and Aboriginal Cosmology*, *Basye Vortex*, 7 September 2009). Vortex theory has been explored in relation to the unconscious (Imre Hermann, *The Unconscious and the Instincts from the Standpoint of the Vortex Theory*, *The Psychoanalytic Review*, 26, 1939, 1). Given the current importance given to narrative, the perspective offered by Juliet Mitchell merits attention (*The Vortex beneath the Story, Whose Freud?: the place of psychoanalysis in contemporary culture*, 2008).

Considerable controversy has been engendered with respect to the Spanish-American novel by José Eustasio Rivera (*La Voragine*, 1924; *The Vortex*, 2003), as discussed by Susan Isabel Stein (*"La vorágine": The Symbolics of Masculine Logic and the Open Vortex(t)*, *Bulletin of Hispanic Studies*, 72, 2). This offers a vision of nature and humanity as grotesquely horrifying. The narrative confronts the hideousness of human exploitation by problematizing a social reality which has remained idealized or effaced in *modernismo*.

In a discussion of *From Proto-Reality to the Act* (*Angelaki: Journal of the Theoretical Humanities*, 5, 2000), Slavoj Žižek makes the following points with regard to "vortex":

- The problem Schelling was struggling with, the point of failure of the three consecutive drafts of *Weltalter*, was the very emergence of logos out of the vortex of the pre-ontological Real of drives, not the problem of how to bring the two dimensions together again.
- what is truly 'unconscious' in man is not the immediate opposite of consciousness, the obscure and confused 'irrational' vortex of drives, but the very founding gesture of consciousness, the act of decision by means of which I 'choose myself', i.e., combine this multitude of drives into the unity of my self.
- What we encounter here is, of course, the logic of the 'vanishing mediator': of the founding gesture of differentiation which must sink into invisibility once the difference between the 'irrational' vortex of drives and the universe of logos is in place.
- The precise German terms (*die Zuschauer sich drehen* - not so much 'turn around another centre' as 'turn/rotate around themselves', make it clear what interests Kant: the subject loses its substantial stability/identity and is reduced to the pure substanceless void of the self-rotating abyssal vortex called 'transcendental apperception'.
- what Lacan does is to read the Freudian reference to the Copernican turn in the original Kantian sense, as asserting not the simple displacement of the centre from the ego to the id or the unconscious as the 'true' substantial focus of the human psyche, but the transformation of the

subject itself from the self-identical substantial ego, the psychological subject full of emotions, instincts, dispositions, etc., to what Lacan called the 'barred subject (\$)', the vortex of the self-relating negativity of desire

Given the mathematical insights into the nature of vortices, it is potentially fruitful to compare them with [mandalas](#) as a traditional means of visually configuring the implied complexity -- especially since in their [yantra](#) form they invite description in geometric terms. To the extent that they are descriptive of a black hole, a mandala is especially indicative of a complex of cognitive dimensions. Whilst a black hole has been associated with a vagina (as noted above), more controversial is the extent to which mandalas are themselves associated with vaginas -- as indicated by the extensive references and imagery in that regard (colouring books, stickers, T-shirts, and the like).

It is therefore intriguing to note that for mathematicians, [E8](#) is any of several closely related [exceptional simple Lie groups](#), linear algebraic groups or Lie algebras of dimension 248. Visually their depiction invites comparison with that of mandalas, as has been variously noted ([E8 - a modern mandala? Perspective](#), 24 April 2008; Bruce Sterling, [E8 Theory of Everything Mandala](#), *Wired*, 23 November 2007; Melissa Hill, [Meditating on Modern Physics: mandalas from scientific thought](#), *Pantheos*, 14 May 2019). Its implications as a sphere in dynamic terms are explored in some detail by Thomas J. McFarlane ([The Integral Sphere: a mathematical mandala of reality](#) June 2004).

Question to ChatGPT: Given the degree of resemblance in the visualizations of the E8 Lie groups and some traditional mandalas (or yantras), the speculative suggestion regarding the black hole as a form of vagina in psychosocial terms, and the many references to vagina mandalas (and their representations), could you comment on the potential implications of this provocative cognitive nexus

The provocative cognitive nexus connecting the visualizations of the E8 Lie group, traditional mandalas or yantras, and the symbolic interpretation of black holes as a form of vagina in psychosocial terms presents a fascinating interdisciplinary confluence of mathematics, spirituality, and psychoanalytic symbolism. This connection invites an exploration of how universal patterns manifest across different fields of knowledge and cultural expressions, potentially revealing deep insights about human cognition, symbolic thinking, and our search for meaning. Here's an exploration of the potential implications:

- **Mathematical and Symbolic Symmetry**
 - **Universal Patterns:** The E8 Lie group, known for its complex and highly symmetrical structure, visually resembles traditional mandalas used in various spiritual traditions as tools for meditation and contemplation. This similarity suggests that there may be universal patterns or archetypes that resonate across different cultural and scientific domains. Carl Jung's notion of universal archetypes might be relevant here, suggesting that certain structures of thought and symbolism are deeply embedded in the human psyche.
 - **Cognitive Resonance:** The resemblance between the intricate mathematical structures and spiritual symbols could indicate a cognitive resonance where humans are naturally inclined to find meaning in complex patterns. This affinity might be rooted in our cognitive architecture, which predisposes us to seek and recognize symmetry, order, and beauty, which are often perceived as aesthetically pleasing and psychologically comforting.
- **Metaphorical and Psychoanalytic Dimensions**
 - **Black Hole as Vagina:** The metaphor of a black hole as a vagina introduces a psychoanalytic dimension, where cosmic phenomena are interpreted through human psychological experiences. This metaphor can be seen as reflecting themes of creation and destruction, birth and rebirth—central motifs in many mythologies and psychological theories concerning the feminine archetype.
 - **Vagina Mandalas:** The reference to vagina mandalas and their representation further ties into themes of fertility, creation, and the sacred feminine. In various cultural practices, mandalas are used to represent wholeness and the universe itself, which ties back to the concept of black holes as all-consuming yet potentially creative forces.
- **Implications for Interdisciplinary Study**
 - **Interdisciplinary Dialogue:** This nexus encourages dialogue between disciplines such as physics, mathematics, psychology, and cultural studies, highlighting how

interdisciplinary approaches can enrich our understanding of both the universe and human nature. By exploring these connections, scholars can develop more integrated theories that address the physical, psychological, and symbolic dimensions of reality.

- Enhanced Understanding of Symbolism: Exploring these visual and symbolic resonances could lead to a deeper understanding of how humans construct meaning from the natural world. This might involve a more nuanced study of how scientific phenomena influence cultural and spiritual symbolism and vice versa.
- Educational and Therapeutic Applications: The integration of mathematical, physical, and psychoanalytical insights might have practical applications in education and therapy. For instance, using universal patterns and symbols to teach complex scientific concepts or to explore psychological themes could be more engaging and transformative for learners and clients.

In conclusion, the provocative cognitive nexus you describe highlights a fascinating area of study that cuts across traditional academic boundaries. It underscores the potential for using universal patterns and symbols to bridge diverse fields and explore the profound connections between the cosmos, human cognition, and cultural symbolism. This interdisciplinary approach not only enriches our understanding but also celebrates the complexity and interconnectedness of all forms of knowledge.

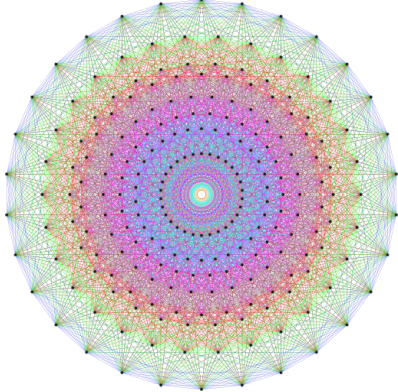

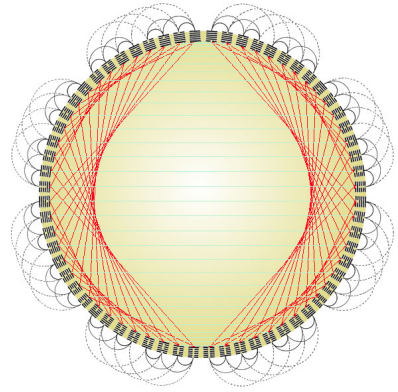
Especially challenging -- and offensively provocative to many -- is the controversy evoked by any association of the vagina with the cognitive integration implied by the mandala (and the E8 by extension). The challenge is exemplified by the correspondence between the use of asterisks in printed communication of swearwords and their use in avoiding explicit reference to deity -- as with G*d (Rebecca Roache, [How the f*** do asterisks work?](#) *Oxford Academic*, 2023; David Marsh, [The risks of using asterisks in place of swearwords](#), *The Guardian*, 23 July 2012; Yehuda Shurpin, [Why Write "G-d" Instead of "G-o-d"? Chabad](#)). Curiously "f****" now features very extensively in public discourse, media entertainment and executive decision-making ([Mysterious Complementarity between Capitalism and Arsenalism: metaphors crucial to sustainability and the crisis of the times](#), 2020; [The Coalition of the Willy: musings on the global challenge of penile servitude](#), 2004).

The challenge is highlighted by the degree to which it is meaningful to describe imperialism as having "f****" colonial territories -- now finding itself "screwed" in return. Such language is similarly meaningful in description of the relationship between Ukraine and Russia, or between Israel and Palestine. In cognitive terms, use of "screwed" is strangely relevant to the dynamics of the engagement with a vortex.

As a preliminary means of clarifying the issues highlighted, a representation of the E8 is included (below left), together with that of the traditional Sri Yantra (below centre). A relevant comment on its mathematical construction is provided by Alexei Pavlovich Kulaichev ([Sriyantra and its Mathematical Properties](#), *Indian Journal of History of Science*, 19, 1984, 3). Indicating its continuing interest for mathematicians, related comments include:

- Jagmohan Singh Sekhon: [Sri Yantra – The Structure of Space Time](#) (*LimitLessThink*, 3 December 2015),
- Aniket Srivastava: [Decoding the Hidden Geometry of Sri Yantra](#) (*LinkedIn*, 3 January 2023),
- T. V. Ananthapadmanabha: [Geometry of Srichakra](#), including a computer program for its construction (*Vagmi Online*)
- Gérard P. Huet: [Sri Yantra Geometry](#) (*Theoretical Computer Science*, 281, 2002, 1)
- Alessandro Chiodo: [On the construction of the Sri Yantra](#) (*Comptes Rendus Mathématique, Académie des Sciences*, 359, 2021, 4)

In discussing [Solving the Sri Yantra](#) in quest of its "optimal" configuration, the Sri Yantra Research Centre notes that in addition to the planar representation (below centre), there is a pyramidal form called Meru (represented [separately](#)). The third and rarest form is the spherical form called Kurma (represented [separately](#)). Some examples of the latter resemble the [omphalos](#) held to represent the navel of the world in Ancient Greece. The image below right is an adaptation of the traditional Shao Yong circle, historically relevant to the clarification of binary logic fundamental to computer operation, as initially explored by [Gottfried Leibniz](#). As the founder of the Arya Maitreya Mandala order, [Anagarika Govinda](#) was author of

Indication of visual resemblances between contrasting integrative symbols		
Representation of E8: 248-dimensional unique complex Lie algebra	Sri Yantra in diagrammatic form, showing how its nine interlocking triangles form a total of 43 smaller triangles.	Representation of transformations identified within the set of 64 hexagrams of the traditional <i>I Ching</i> .
		
Jgmoxness, CC BY-SA 3.0, via Wikimedia Commons	HST108, Public domain, via Wikimedia Commons	Adaptation of the Shao Yong circle

This argument frames the question as to whether the fundamental issues implied by the static images above invite more indicative dynamic visualizations of any cognitive representation of a "vortex" -- however controversial.

The image on the left below was generated by DALL-E following a prompt via the ChatGPT Scholar-ai plugin, which gave rise to the following response.

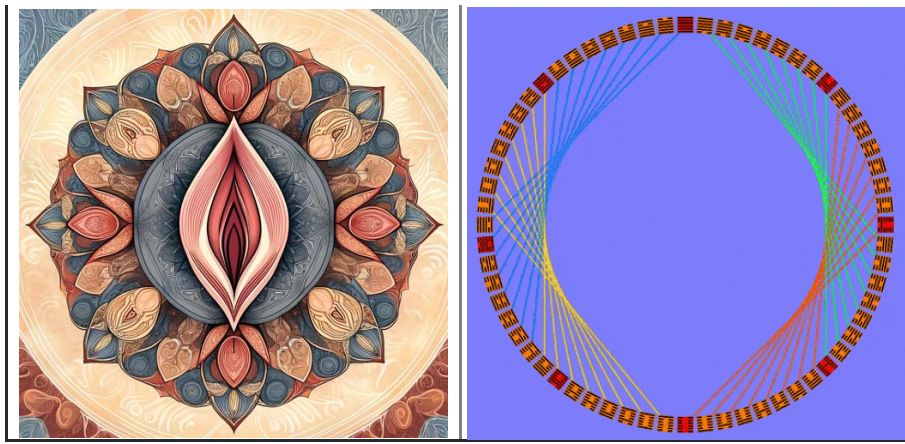
If you were to ask DALL-E to create an image of a "vagina mandala," you would need to provide a textual description that is both clear and detailed. Here's how you might approach it: You could specify "Create an artistic representation of a mandala inspired by the theme of femininity and natural forms, incorporating abstract and symbolic elements that suggest the concept of a vagina without being explicit." This type of description helps guide the AI to generate an image that is abstract and symbolic rather than explicit, aligning with content guidelines and respecting sensitivity around the subject...

For projects that involve sensitive or complex symbolic content, it's crucial to frame requests in a way that aligns with these considerations, potentially supplementing or substituting AI tools with human artistic input or other digital art tools for greater control and sensitivity...

Here is the artistic representation of a mandala inspired by the theme of femininity and natural forms. The design incorporates abstract and symbolic elements that subtly suggest the concept of a vagina, crafted to be tasteful and suitable for a general audience. You can view and interact with the image.

ChatGPT declined to use DALL-E to generate the Sri Yantra. The animation on the right below is an experimental dynamic adaptation of the Shao Yong circle (above right). It focuses only on one particular type of relationship between the 64 hexagrams. The simple dynamic, using a shifting pattern of colours between quadrants, is designed to suggest the dynamics of a vortex. Much more complex patterns -- with more attractively "sexy" connotations -- could be envisaged by incorporating and phasing the other relationships between the hexagrams indicated above. ChatGPT assisted in the development of the X3D program enabling the animation below..

Experimental use of AI to enable visualization of the cognitive challenge of vortex dynamics	
"Vagina mandala" generated by DALL-E	Animation indicative of vortex dynamic between hexagrams



The pattern of hexagrams has been associated with musical tones, suggesting appreciation of dynamic connectivity through another modality (*Aesthetic connectivity of patterns in music*, 2024). Given the 64-fold pattern of the *Kama Sutra*, a mathematical perspective on the engagement with otherness is discussed separately (*Reframing the Dynamics of Engaging with Otherness: triadic correspondences between Topology, Kama Sutra and I Ching*, 2011).

ChatGPT was challenged to consider generating a dynamic version of the "vagina mandala" using [SORA](#) -- potentially by developing the static image (above left)

Using SORA (Spatial Operating Research Assistant) or similar advanced visualization and interaction platforms can indeed extend the concept of creating dynamic, interactive visualizations like a "vagina mandala" with added dimensions of user engagement and deeper exploration of themes.

- Potential Applications of SORA for a Dynamic "Vagina Mandala"
 - Interactive Elements: SORA could be used to create a dynamic and interactive version of the mandala where viewers can interact with various elements of the artwork. For instance, elements could expand, change color, or reveal additional layers of meaning as the user interacts with them.
 - Educational Integration: The platform can incorporate educational tooltips or side panels that provide insights into the symbolism within the mandala, explanations of its cultural significance, or information on the artistic techniques used. This would make it a powerful tool for cultural education and appreciation.
 - Customization Features: Users could modify aspects of the mandala, such as color schemes or patterns, to see how these changes affect the overall composition and symbolism. This could be an enlightening way to explore personal interpretations of symbolic art.
 - Virtual Reality (VR) Integration: If SORA supports VR, the mandala could be explored in a fully immersive environment, enhancing the depth and intimacy of the interaction. Viewers could "enter" the mandala, experiencing its elements surrounding them in 360 degrees.
 - Augmented Reality (AR) Applications: Using AR capabilities, the mandala could be projected into real-world spaces, allowing users to see how it interacts with various environments, adding a layer of personal context to the artwork.
 - Social Sharing and Collaboration: The platform might allow users to share their customizations or interpretations with others, facilitating discussions or collaborative projects that could lead to community-driven art projects.
- Technical and Ethical Considerations: When developing such a project, especially one involving sensitive and culturally significant themes, a few considerations are essential:
 - Cultural Sensitivity and Appropriateness: Ensure that the project handles cultural elements respectfully and educates users about their significance and context.
 - Privacy and Data Security: If the platform collects user data or allows for social interaction, robust measures should be in place to protect user privacy and data.
 - Accessibility: Design the interaction to be accessible to users with varying abilities, ensuring that everyone can engage with and learn from the experience.

Using a platform like SORA for a dynamic "vagina mandala" could not only enhance the visual and

interactive appeal of the artwork but also deepen users' understanding and appreciation of its cultural and symbolic meanings.

Here's a detailed guide on how you might approach this project to create an artistic representation of a mandala inspired by themes of femininity and natural forms:

- Concept Development:
 - Theme and Symbolism:
 - Define the core themes: femininity and natural forms.
 - Identify symbolic elements that are culturally sensitive and appropriately represent the theme. These could include shapes like circles, spirals, or natural motifs like leaves and flowers that subtly suggest but do not explicitly represent genitalia.
 - Artistic Style:
 - Decide on a color palette that resonates with the theme—soft pastels or vibrant natural colors could be suitable.
 - Choose a style for the mandala that balances between traditional mandala symmetry and modern artistic expressions.
- Design
 - Sketching and Prototyping:
 - Start with paper sketches or digital mock-ups to explore different layouts and configurations of the mandala.
 - Once a design is chosen, create a detailed digital prototype. Tools like Adobe Illustrator or similar vector graphics software can be used for high precision and scalability.
- Implementation in SORA
 - Importing the Design:
 - Convert your finalized design into a format suitable for SORA, which may involve creating a 3D model or adapting the design into SORA's specific format.
 - Interactive Features:
 - Zoom and Explore: Allow users to zoom in and explore different parts of the mandala, revealing hidden details or meanings embedded within smaller elements.
 - Information Layers: Implement clickable areas that, when interacted with, display information about the symbolism and artistic choices behind different parts of the mandala.
 - Customization Options: Provide tools for users to change colors or add elements to the mandala, enabling personalization and a deeper connection with the artwork.
 - Animation:
 - Consider subtle animations that bring the mandala to life—gentle pulsing of elements, or a slow rotational symmetry that mimics natural patterns.
- User Interaction Design
 - Interface Design:
 - Design a user interface that is intuitive and enhances the user's experience without overwhelming the artistic content.
 - Ensure the interface provides accessible navigation, especially for users with disabilities.
- 5. Testing and Feedback
 - User Testing:
 - Conduct user testing sessions to gather feedback on the usability and interpretive value of the interactive mandala.
 - Observe how users interact with the features and make adjustments based on their feedback to improve the experience.
- 6. Launch and Promotion
 - Deployment:
 - Deploy the interactive mandala on SORA, ensuring it is optimized for various devices and screen sizes.
 - Ensure technical stability and load testing to handle potential high traffic.
 - Promotion:
 - Promote the interactive mandala through social media, educational platforms, and cultural institutions to reach a broad audience.

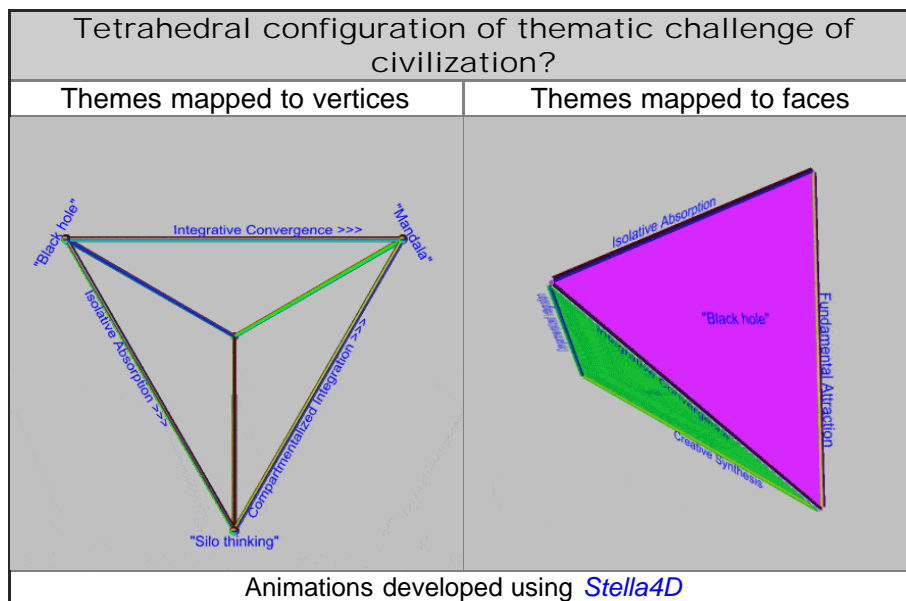
- Consider partnering with educational organizations or museums to use the mandala as an educational tool to explore themes of femininity and natural symbolism.
- Ethical and Cultural Considerations: Always remain sensitive to the cultural and ethical implications of designing with themes related to femininity and natural forms. Engage with cultural consultants if necessary to ensure that the content is respectful and educational.

By following these steps, you can use SORA to create a dynamic, interactive, and educational artistic representation of a mandala that thoughtfully embodies the themes of femininity and natural forms, providing an enriching experience for all users.

Transdisciplinary configuration of the disparate?

The argument addresses the relationship between fundamentally disparate conceptual frameworks. The necessity for a focus on "disparate" can be variously discussed ([Dynamics of N-fold Integration of Disparate Cognitive Modalities](#), 2021; [Global Coherence by Interrelating Disparate Strategic Patterns Dynamically](#), 2019; [Polyhedral clues to the dynamics of relating disparate ways of looking](#), 2022; [Global ethical nexus of disparate challenges](#), 2022).

The interrelationship between the themes of this section can be suggestively configured together as shown in the tetrahedral animations below. On the left, each vertex is labelled within quotes as indicative of specific metaphorical connotations; the dual variant on the right has each theme as a face of the tetrahedron. The labelling of the edges suggests (very tentatively) how the respective vertices might be understood as related. The directional implications and emphases of the edges is suggested by the "arrow heads". Fortuitously, the dynamics of the rotation switches that diirectionality, thereby offering a sense of the ambiguity of each relationship.



The tetrahedral facial presentation of themes is discussed separately in more detail ([Comprehension of Singularity through 4-fold Complementarity](#), 2024). Of potential relevance to such conceptual configuration is [tetrad formalism](#) as an approach to [general relativity](#). This generalizes the choice of basis for the [tangent bundle](#) from a [coordinate basis](#) to the less restrictive choice of a local basis, i.e. a locally defined set of four linearly independent [vector fields](#) called a [tetrad](#) or [vierbein](#). It is a special case of the more general idea of a [vielbein formalism](#), which is set in [\(pseudo-\)Riemannian geometry](#).

Although a representation can be conveniently presented in 3D -- necessarily an advance on preferences for 2D -- it is appropriate to recall that this is itself a misleading convenience, given the probability that what now merits understanding calls for a 4D configuration, as with indicative use of tesseract for logical opposition ([Oppositional logic?](#) 2018; [Oppositional Logic as Comprehensible Key to Sustainable Democracy](#), 2018). Some of the issues from a mathematical perspective are summarized by Jordana Cepelewicz ([What Makes 4D Weirder Than All Other Dimensions?](#) *Quanta Magazine*, 13 May 2024)

Given doubts regarding appropriate wording of the edge-relationships in the tetrahedral nexus, the following initial proposal was put to ChatGPT for potential refinement.

Question to ChatGPT: In this exchange there is an implied degree of correspondence between: black hole, mandala, vagina, and silo thinking -- each understood in metaphorical terms and from a cognitive perspective. These are each positioned as the vertex of a tetrahedron. Tentative wording for the nature of each of the 6 bi-directional relationships is: Black hole / Mandala (Cognitive integration), Black hole / Silo thinking (Unchecked obsession), Black hole / Vagina (Vortical attraction), Silo thinking / Mandala (Systemic isolation), Silo thinking / Vagina (Cognitive sexualization), Mandala / Vagina (Sexualization of integration). Can you improve on that wording, or comment otherwise

Using a tetrahedron to explore the metaphorical and cognitive relationships between black hole, mandala, vagina, and silo thinking is intriguing and rich with potential for deep symbolic analysis. The tentative descriptions for the bi-directional relationships provide a good starting point for exploring these connections. Here's an attempt to refine the wording and provide additional insights:

- **Black Hole / Mandala: Integrative Convergence:** Both concepts imply a centering force and a convergence into a singular point. The term "Integrative Convergence" captures the idea of disparate elements coming together into a unified whole, analogous to the gravitational pull of a black hole and the symbolic unity of a mandala.
- **Black Hole / Silo Thinking: Isolative Absorption:** Black holes absorb everything without escape, much like silo thinking absorbs ideas without external influence. "Isolative Absorption" emphasizes the self-contained, inward nature of both concepts that limits external interaction.
- **Black Hole / Vagina: Fundamental Attraction:** This relationship metaphorically aligns with the ideas of creation and origin, where the black hole's gravitational pull and the vagina as a birth passage suggest a deep, inherent attraction that is both creative and destructive. "Fundamental Attraction" speaks to the essential, powerful nature of both.
- **Silo Thinking / Mandala: Compartmentalized Integration:** While mandalas represent integrative unity, silo thinking often involves compartmentalization within a system. "Compartmentalized Integration" reflects the paradox of striving for holistic understanding within constrained thought systems.
- **Silo Thinking / Vagina: Restrictive Fertility:** Linking silo thinking and vagina through the lens of "Restrictive Fertility" can imply the potential for new ideas (birth) being limited or defined by narrow, restricted thinking, akin to fertility being constrained within certain parameters.
- **Mandala / Vagina: Creative Synthesis:** Both the mandala and the vagina can symbolize creation, growth, and the generation of life and ideas. "Creative Synthesis" captures the fusion of these elements into a productive and generative unity.

Commentary: The model intriguingly sets up a framework for understanding complex interrelationships through metaphorical and cognitive lenses. By refining the descriptions of these relationships, we can better capture the nuances of each connection, emphasizing both the complementary and the contrasting aspects of how these concepts interact. This approach not only deepens our understanding of each element but also how they influence and reflect broader psychological and cultural narratives.

Furthermore, this model could serve as a basis for discussions in fields ranging from cognitive science to cultural studies, offering a structured yet flexible way to explore how different concepts symbolically and functionally relate to one another in human thought.

Intriguingly the vertices indicated in the animation on the left (above) can be understood as attractors competing in contrasting and complementary ways -- potentially to be explored as configured in a [tensegrity](#).

Question to ChatGPT: A more conceptually systemic mapping could be made onto a tensegrity tetrahedron. In such a case the compression struts would be indicative of intractable "distinctions" and the tension links would be indicative of associative "correspondences". In which case could you split the previous link labels in those terms.

The idea of using a tensegrity structure to model the metaphorical and cognitive relationships among the concepts of black hole, mandala, vagina, and silo thinking is both innovative and symbolic. Tensegrity, a portmanteau of "tension" and "integrity," is a structural principle that employs a combination of discontinuous compression elements (struts) and continuous tensile elements (cables or tendons). This model perfectly suits conceptual mappings where some relationships are more about distinct separations or contrasts (compression) and others about connecting links or associations (tension).

Assigning Tensegrity Elements to Conceptual Relationships: In the tensegrity model of these relationships, the compression struts could represent intractable distinctions—relationships where the concepts fundamentally differ or are in opposition. The tension cables would then represent associative correspondences—relationships where the concepts are interconnected or synergistic. Here's how your previous mappings could be distributed into this tensegrity framework:

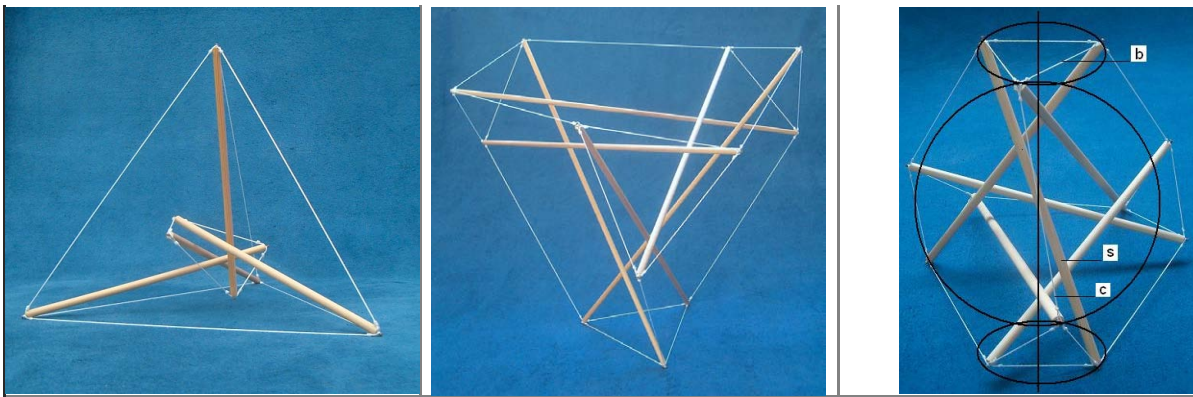
- Compression Struts (Intractable Distinctions):
 - Black Hole / Silo Thinking: Isolative Absorption: This relationship emphasizes containment and isolation, which are fundamentally about separation and limiting external influence. It symbolizes a distinction in how ideas or matter are contained or absorbed without escape.
 - Silo Thinking / Mandala: Compartmentalized Integration: Reflecting the division within unity, this relationship shows how structured separation within a unified whole can still exist, symbolizing the distinction between holistic integration and compartmentalized thought.
 - Silo Thinking / Vagina: Restrictive Fertility: This represents a tension between the potential for new life and ideas and the constraints imposed on that potential, illustrating a fundamental distinction between growth and restriction.
- Tension Cables (Associative Correspondences):
 - Black Hole / Mandala: Integrative Convergence: Both concepts involve the convergence of disparate elements into a unified center, representing a deep association between cosmic and symbolic unification.
 - Black Hole / Vagina: Fundamental Attraction: This relationship connects the concepts through the theme of origin and powerful, inherent attraction, signifying a creative and destructive force that binds them.
 - Mandala / Vagina: Creative Synthesis: Both symbolize creation and generative processes, whether in art, spirituality, or biological reproduction, highlighting an associative and productive connection.

Commentary on Tensegrity Model Application: Using tensegrity to model these relationships allows for a dynamic representation of how these concepts interact. The compression struts signify the robust, often rigid distinctions that can exist, while the tension cables illustrate the flexibility and connectivity among ideas, emphasizing how they can stretch and maintain balance despite their differences. This structure not only visually represents but also helps in understanding the stability and tension within conceptual relationships.

This approach can deepen our understanding of how distinct ideas interact in a complex system, reflecting both their separations and connections. It also serves as a powerful metaphor for discussions in cognitive science, psychology, and cultural studies, providing a structured yet flexible way to explore symbolic relationships in human thought and culture.

Of particular interest from a mathematical perspective, and that of cognitive architecture, is the work on tensegrity of [Marcelo Pors](#), and specifically on tetrahedral structures -- of which a selection of images are reproduced below. Those on the right feature in a discussion of [Mathematics, tetrahedron, tensegrity](#). These can be considered indicative of the complex dynamic nature of the 4-fold cognitive nexus.

Tetrahedral-based tensegrity configurations	
4-strut 10-string tensegrity	Truncated tetrahedral tensegrity



Reproduced with permission from Marcelo Pars ([Tensegrity](#)). See also interactive [3D variants](#)

Question to ChatGPT: The architectural constraint for a tetrahedral tensegrity is such that the simplest appears to require 10 tension elements linking the 8 vertices (of the 4 struts), each vertex being 3-valent. Can you offer conceptual wording in response to that "knowledge architecture" design requirement

The architectural constraints of a tetrahedral tensegrity structure, requiring a more complex network of tension cables and compression struts, indeed presents a fascinating challenge when trying to map conceptual relationships onto such a structure. This added complexity allows for a richer and more interconnected representation of how these concepts might dynamically interact, not just in pairs but as a complete system where each element influences and is influenced by multiple others.

- Reframing Conceptual Relationships in a Tensegrity Tetrahedron: Given the requirement of a tetrahedral tensegrity structure to have 10 tension elements linking the 8 vertices (formed by the ends of the 4 struts), each vertex being 3-valent, we can imagine a more intricate web of interactions among the four concepts: black hole, mandala, vagina, and silo thinking. Here's how you could conceive of this:
 - Conceptual Framework for Tensegrity Mapping
 - Compression Struts (4 Concepts): These represent the core structural 'distinctions' or separate identities of each concept.
 - Black Hole
 - Mandala
 - Vagina
 - Silo Thinking
 - Tension Cables (10 Associative Correspondences): Since each vertex is 3-valent, it suggests that each concept (each strut's end) is directly connected to three other concepts through associative correspondences, indicating a complex interplay of influences and relationships.
 - Suggested Wording for Each Tension Cable: Here, each cable can be thought of as representing a specific kind of relationship or interaction, potentially highlighting different aspects or dimensions of the relationships than previously considered:
 - Black Hole to Mandala: Gravitational Harmony: Symbolizing the gravitational pull that aligns disparate elements into a harmonious, ordered structure akin to a mandala's design.
 - Black Hole to Vagina: Origin Dynamics: Representing the interplay of creation and destruction, the birth of universes, and the birth of life—fundamental forces of nature.
 - Black Hole to Silo Thinking: Event Horizon Isolation: The boundary within which nothing can escape can metaphorically relate to the isolating nature of silo thinking, where ideas cannot escape or evolve.
 - Mandala to Vagina: Symbolic Birth: Connecting the symbolic creation aspects of mandalas with the literal and metaphorical creation associated with the vagina.
 - Mandala to Silo Thinking: Structured Thought: The structured, organized nature of mandalas provides a framework or blueprint that can organize or compartmentalize thought in siloed environments.
 - Vagina to Silo Thinking: Life within Bounds: Discussing the nurturing of new life and ideas within the constrained or defined boundaries of siloed thinking.
 - Interconnections (Remaining Links): Explorative Synthesis: Additional links could explore secondary or less direct interactions, such as how the concepts

affect each other through indirect means or over larger systems, perhaps influencing societal or cultural perceptions.

- Conceptualizing the Tensegrity Structure: The design of a tensegrity structure for these concepts not only helps in visualizing the balance and tension between these ideas but also in understanding how they might collectively influence a system. Each connection or cable could represent different dynamics or forces at play, illustrating a complex web of interactions where changes in one relationship could impact the stability or character of others. This model encourages a holistic view of these relationships, moving beyond binary interactions to appreciate the multi-dimensional interdependencies that shape our understanding of complex concepts.

Promoted through the work of [Buckminster Fuller](#) (*Synergetics: Explorations in the Geometry of Thinking*, 1975), the psychosocial implications of tensegrity can be variously explored (*Transcending Psychosocial Polarization with Tensegrity*, 2021; *Eliciting Patterns of Global Consensus via Tensional Integrity*, 2023)

The argument can be taken further -- speculatively -- in the light of the continuing mystery of the many [Roman dodecahedra](#) discovered. Each of their 12 faces has a circular hole of varying diameter, with the holes connecting to the hollow center, and each corner having a protruding knob. One of a number of hypotheses is that it was the basis for a form of mathematical game, making various use of threads to be wound between the knobs (*Roman Dodecahedrons Part II*, *Tinkerings*, 17 June 2020). It might then be compared to Rubik's Cube in the light of the argument by David Singmaster (*Utility of Recreational Mathematics*, *The UMAP Journal*, 37, 2016, 4).

Another possibility is that the Roman dodecahedron offered a means to configure the truncated tetrahedral tensegrity (depicted above right) -- through a form of ritual game using mnemonic threads. Given the importance associated with the relations within the pantheon of 12 paired Greco-Roman gods and goddesses in that period (*Dii Consentes* or *Twelve Olympians*), the pairs could have been associated with six struts -- each extreme indicative of one of the pair -- with the challenge of configuring them meaningfully. This resembles the current challenge of Rubik's Cube or that of the more complex Magic Dodecahedron ([Megaminx](#)). By selectively passing the struts through the holes, the challenge would have required use of the threads to link them together -- effectively constructing the early [Dodekatheon](#), for which the dodecahedron served as a form of template. Appropriately the Dodekatheon was associated with the [omphalos](#) (mentioned above), typically depicted with a tracework of vines. The current relevance of devices like the [Roman dodecahedron](#), [Chinese puzzle balls](#) and [Rubik's Cube](#) is discussed separately (*Time for Provocative Mnemonic Aids to Systemic Connectivity?* 2018; *Harmonizing Dissonance via a Rubik's Cube Framework*, 2024).

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