13th International Conference

Science & Scientist 2025

Considering a Hegelian Dialectical Approach to the Science and Philosophy of Biology

CONFERENCE PROGRAM

Registration

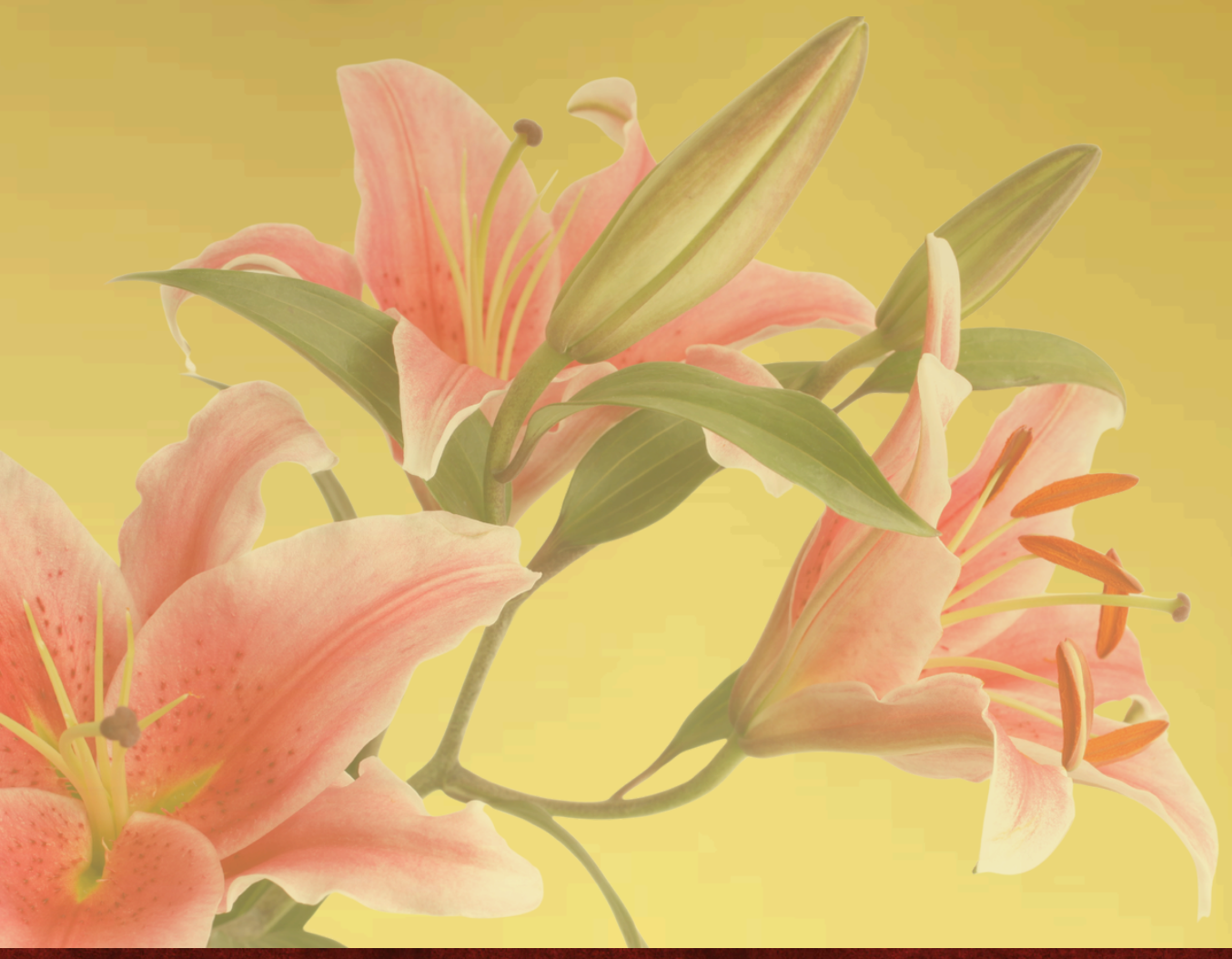
Online

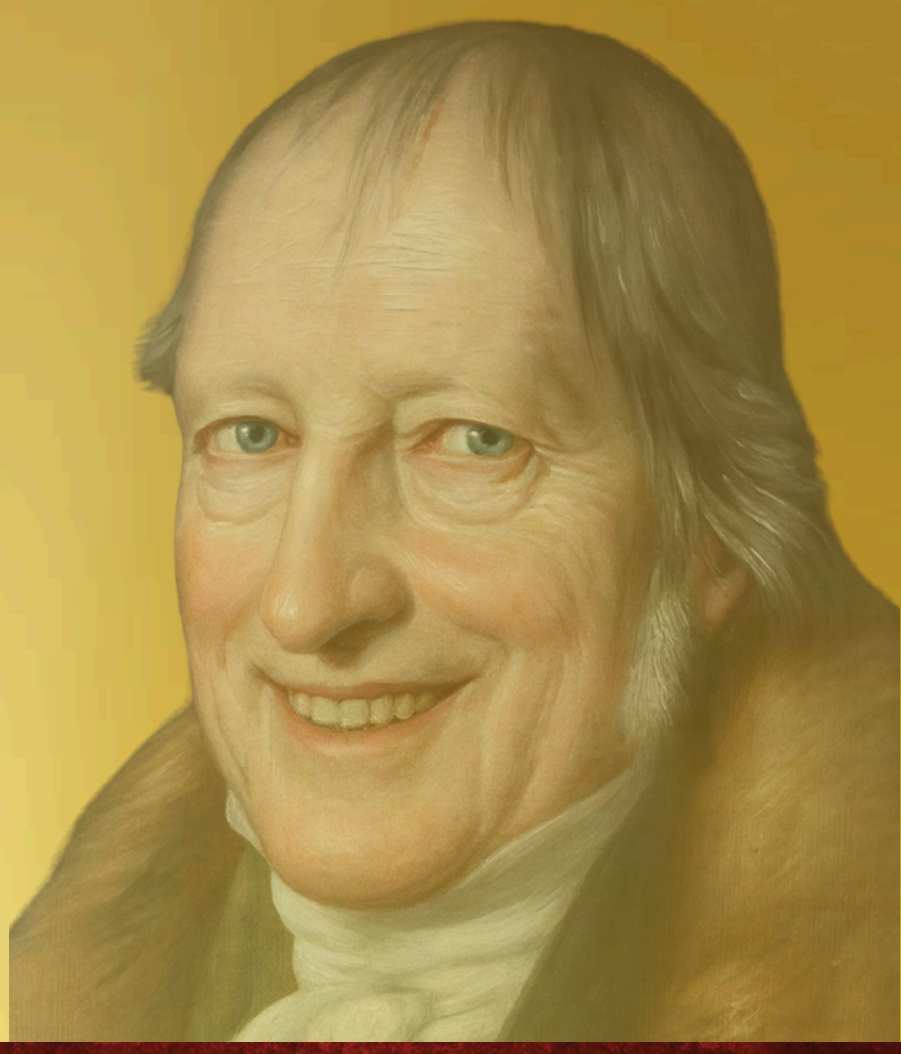
Saturday, December 13, 2025

6:30 am - 1:30 pm | ET USA

12:30 - 7:30 pm | Swiss/Madrid

5:00 pm - 12:00 am | India





Organizer

BHAKTI VEDANTA INSTITUTE
of Spiritual Culture and Science

PRINCETON, NEW JERSEY, USA

About Conference Topic

This conference aims to contribute to the application of a dialectical approach to the science and philosophy of biology by facilitating an opportunity for scientists and academics to share their work on dialectical perspectives in general, and particularly exploring the Hegelian dialectic.

The Dialectical Biologist was published by biologists Richard Levins and Richard Lewontin in 1985. One of the significant contributions of this text was establishing a more dynamic bilateral relationship between organisms and the environment, where "the environment is a product of the organism, just as the organism is a product of the environment." In conventional biology, the environment unilaterally determines the organism. Levin and Lewontin's progressive perspective was based upon the authors' understanding of dialectical philosophy:

"Parts and wholes evolve in consequence of their relationship, and the relationship itself evolves. These are the properties of things that we call dialectical: that one thing cannot exist without the other, that one acquires its properties from its relation to the other, that the properties of both evolve as a consequence of their interpenetration."

Although it has yet to be thoroughly explored, dialectical descriptions of nature can be extended to DNA-protein relationships, where both are dependent on and constitutive of the other. DNA provides the instructions for protein synthesis, while proteins organize, regulate, and give structure to DNA. Their properties arise only through this reciprocal interaction, not in isolation. A dialectic isn't simply circular or a feedback loop. Rather, it's a dynamic unity of opposites. Together they form a system that self-perpetuates and transforms, not reducible to either component alone.

A result of dialectical biology that has garnered increasing attention in recent years is niche construction. Lewontin is credited with initially popularizing this phenomenon via publications throughout the 1970s and 80s, explaining that organisms actively modify and construct their environment rather than passively adapting to conditions. Later on, in 1988, this was formally termed "niche construction" by biologist John Odling-Smee. Among other phenomena at the forefront of 21st-century biology's extended evolutionary synthesis, niche construction offers significant challenges to Neo-Darwinian evolution driven by natural selection.

Biomimicry is another manifestation of the organism-environment dialectic, where humans first observe nature's numerous problem-solving strategies at varying scales of the environment (form, behavior, and system), apply relevant strategies to human problems, and then engineer technological, architectural, and social constructs based on biomimetic strategies that positively impact the environment while fulfilling human needs. Interestingly, biomimicry not only exemplifies the organism-environment dialectic — which can also be thought of as a self-other dialectic — but it also demonstrates a mind-matter (or subject-object) dialectic. Here, the individual is simultaneously shaping and shaped by its environment. As described in a recent paper by the Princeton Bhakti Vedanta Institute, the self both influences and is influenced by its other. An observer or subject determines and is determined by the observed object. The subject perceives the object based upon the inherent categories of thought that it possesses, while the object impresses particular qualities upon the subject. Due to this interpenetrating dynamic, a kingfisher can be understood as a small and brightly colored tropical bird requiring preservation, a bad omen for the Dusun warriors of Borneo, a symbol of love in Greek mythos, a biomimetic model for Japan's Shinkansen bullet train, or all of the above. Each group has a unique perception of the kingfisher depending on their particular needs and sociocultural context. In biomimicry, an observed object is a reflection of the observing subject, where, depending on the unique perspective and needs of the subject, the object appears differently. This demonstrates a mind-matter dialectic where thinking and being are inextricably intertwined.

G.W.F. Hegel (1770-1831) offers a perspective focused on the Concept that forms and informs nature. Here, understanding the truth of reality, of which nature is part, requires perceiving it as a whole that is not only positively existing substance, but also subject or cognition that negates the immediacy of existence. This leads to the dialectical unfolding of the dynamic relationship of subject/thinking/mind and substance/being/matter, which traverses logical, natural, and spiritual dimensions as the Absolute is revealed to Itself. Hegel's dialectic goes further than Levin and Lewontin's understanding, in that it describes the dynamic movement and self-unfolding of conceptual thinking. The triadic structure of this movement is sometimes simplified by Hegel's commentators as thesis-antithesis-synthesis. In this dynamic movement — where each stage or moment is unfolded out of the previous — tension internal to an immediate stage of conceptual thinking (thesis) confronts and negates the immediacy (antithesis), which serves as mediation leading to a higher unity of thought where both stages are reconciled and preserved in the blossoming of a more comprehensive conception (synthesis). This conference hopes to explore the relevance of Hegel's view for uncovering new insights about nature and its higher development.

In Hegel's philosophy, the Concept (Begriff) is the fundamental, dynamic, and self-organizing structure of all thought and reality. While in common parlance a "concept" refers to a static, abstract idea in our heads (i.e. the concept of "this" or "that"), for Hegel, Concept is the active and self-moving force of reason itself. It is not just a mental idea or abstraction, but the living, rational principle through which everything comes to be, develops, and is understood. In short, the Concept is the logical "soul" of the world. As continuous dynamic activity, the threefold structure of the Concept contains Universal, Particular, and Individual moments. Universality is pure undifferentiated potential; it is the simple and abstract identity of a thing. Particularity is the moment of difference and determination where the universal must divide itself into particulars to become real and the initial identity breaks apart into specific forms. Individuality or singularity is the moment of concreteness, where abstract identity (universality) and abstract differentiation (particularity) are united and sublated (aufheben) such that their features are preserved while their abstraction is negated by the concrete identity-in-difference that is individuality. For example, an individual lemon in your hand is an instatiation of both universal plant-ness and particular fruit-ness. It is simultaneously an instance of that which is indeterminate as well as that which has particular determination. This Hegelian conceptual perspective has concrete implications for inspiring deeper insights about plant grafting, animal hybridization, and other phenomena. For instance, "fruit cocktail trees" contain grafts of several different species of fruit tree onto a single tree that grows each kind of fruit simultaneously. Only certain kinds of fruit trees are compatible for growing together on a single tree, i.e. stone fruit cocktails (peaches, plums, nectarines, apricots, cherries) and citrus cocktails (lemons, limes, oranges, grapefruits). This shows the conceptual layers of the phenomena, where although they are all trees in a universal genus sense, the difference or likeness among particular kinds or species of fruit trees determines compatibility that manifests in the viability of individual grafting specimens. Plums and peaches are compatible, but lemons and peaches are not. The same principle can be observed in reproductive compatibility for animal hybridization. Horses (female) and donkeys (male) can produce mules while lions (male) and tigers (female) make ligers, but horses and tigers are not compatible. The Concept is inherently self-moving and self-contradictory, and the various aspects of its triadic structure contain real determination that matters to empirical reality. The Concept cannot remain in its abstract, universal state; it must move outward into particularity and then return to itself in a richer, more concrete individual form. From a more transcendental perspective, the Concept is the universal, living structure of self-determination. It is the essence of subjectivity itself, i.e. it is not tied to this or that finite form, but is the logic of infinite self-knowing Spirit.

RELEVANCE TO CONTEMPORARY SCHOLARSHIP:

Dr. B Madhava Puri (Michael Marchetti), Serving Director of the Princeton Bhakti Vedanta Institute and the inspiration behind this conference series, established one of the first Hegel resource sites on the internet (**GWFHegel.org**), with the help of others, in the late 1990s. This site is listed under External Hegel Links > Online Articles and Secondary Resources on The Hegel Society of America's **website**.

At present, there is a renaissance of renewed interest in Hegelian scholarship, which includes the application of his distinguished dialectical thought to the philosophy of biology. This includes:

◆ A series of articles written about Hegel that are relevant to the philosophy and science of biology, which we've found helpful:

- Saks, Valdur, et. al. 2009. "Philosophical Basis and Some Historical Aspects of Systems Biology: From Hegel to Noble – Applications for Bioenergetic Research." International Journal of Molecular Sciences. https://doi.org/10.3390/ijms10031161
- Mowad, Nicholas. 2010. "The Soul and the Body in Hegel's Anthropology." Loyola University Chicago. https://ecommons.luc.edu/luc_diss/208/
- Windle III, Robert. 2013. "The Dialectical Environment of the Mind: A Philosophical Foundation for Biomimicry in the Theories of G.W.F. Hegel and Jean Piaget." University of Colorado Denver. https://www.academia.edu/15615854/
- Sandnes-Haukedal, Rasmus. 2023. "Agency and Organisation: The Dialectics of Nature and Life." Durham University. https://etheses.dur.ac.uk/14893/

◆ An entire special issue of the Hegel Bulletin on "Hegel and the Philosophy of Biology" in December 2020

◆ A presently ongoing research project on "AUTONOMY – From Biological to Cognitive Autonomy: An Enactive Approach to Hegel's Philosophy of Mind" at the University of Luxembourg

◆ The recent Revitalizing Biophilosophy Online Conference (July 10-11, 2025), where Krishna Keshava Das of the Princeton Bhakti Vedanta Institute had the opportunity to discuss Hegel's relevance with conference organizers

◆ The recent Cognizing Life Conference (July 16-19, 2025) acknowledged the growing interest in reconsidering Hegel's philosophy of biology, among other prominent German Romantics and Idealists

The Princeton Bhakti Vedanta Institute believes that by exploring Hegel's philosophy, significant advancements can be made in developing and applying the relevance of self-other and mind-matter dialectics to the positive progression of 21st-century biology and ecology, as well as developing the utility of considering nature's universal, particular, and individual aspects through conceptual thinking. Studying dialectics in the way described here also provides an opportunity to dive deeper into the Vedantic conception of Bheda Abheda (simultaneous difference and nondifference), which is related to Sri Krishna Chaitanya Mahaprabhu's Achintya Bheda Abheda, and its relevance for conceiving Spirit.

The truly Dialectical Scientist soberly examines the metaphysical preferences underlying empiricist and physicalist approaches, and honestly addresses the influence that the pre-existing contents of consciousness hold over all acts of empirical observation. Such an approach overcomes the theory-ladenness that has prevented science from providing deeply satisfying integrative descriptions of matter, life, consciousness, and self. Through our publications and this Science & Scientist conference series, the Princeton BVISCS strives to foster cultural and scientific progress beyond materialistic values and medical/technological advancement. Humans live longer and have fancier gadgets, yet suffer worldwide from an environmental and mental health crisis. We don't know how to harmonize with our surroundings, and our minds have grown uneasy. The serving scholars of the BVISCS hope that Science & Scientist 2025 can be a step in the right direction.

Schedule

INTL. TIMES	SPEAKER	TALK TITLE
6:30-6:45 AM ET USA 12:30-12:45 PM Madrid/Switzerland 5:00-5:15 PM India	Krishna Keshava Das (USA)	Tribute to Dr. B Madhava Puri (1943-2025) – Recording of His Inaugural Address for the Science & Scientist Conference Series
45 min talks + 15 min Q&A for all speakers		
6:45-7:45 AM ET USA **12:45-1:45 PM Madrid/Switzerland** 5:15-6:15 PM India	**Johannes Wirz (Switzerland)**	Towards a new biology of life: On the loss and the rediscovery of plant and animal wholes
7:45-8:45 AM ET USA 1:45-2:45 PM Madrid/Switzerland 6:15-7:15 PM India	**Krishna Keshava Das (ET USA)**	The Dialectics of Niche Construction and Biomimicry
8:45-9:45 AM ET USA 2:45-3:45 PM Madrid/Switzerland **7:15-8:15 PM India**	**Niraj Kumar (India)**	An unending tryst for absolute Knowledge
9:45-10:45 AM ET USA **3:45-4:45 PM Madrid/Switzerland** 8:15-9:15 PM India	**David Angeler (Madrid) & Julie Maybee (ET USA)**	Dialectical ecosystems: reconciling opposites in the science and philosophy of life
10:45-11:45 AM ET USA 4:45-5:45 PM Madrid/Switzerland 9:15-10:15 PM India	**Darrell Arnold (ET USA)**	From Hegelian Organicism to Boulding's Ecosystems Theory. Biological Holism and Social Theory
11:45 AM - 1:15 PM ET USA 5:45-7:15 PM Madrid/Switzerland 10:15-11:45 PM India	***Interdisciplinary Dialogue*** **(30 min) –** Question 1: Limits of dialectical knowing **(30 min) –** Question 2: Dialectics under constraint **(30 min) –** Audience Q&A / Free discussion amongst speakers	
1:15-1:30 PM ET USA 7:15-7:30 PM Madrid/Switzerland 11:45 PM - 12:00 AM India	Conference conclusion by Krishna Keshava Das	

Interdisciplinary Discussion Questions

Question 1 – Limits of dialectical knowing

Several contributions (particularly Wirz, Das, and Kumar) highlight the movement toward holistic, integrated conceptual frameworks, sometimes approaching the Absolute.

How should we understand the role of systemic limits or thresholds in dialectical development: moments where a system cannot internally resolve its own tensions until a transformation occurs (e.g., conceptual sublation, ecological regime shift, or evolutionary leap)? Could such limits be intrinsic sources of creativity, and how might they inform the way we theorize knowledge, resilience, or change in living systems?

Question 2 – Dialectics under constraint

Building on the discussions of niche construction, organism-environment dialectic, and social-ecological transformations (Das, Angeler/Maybee, Arnold):

To what extent does dialectical movement in natural systems occur freely versus being shaped or bounded by constraint conditions (biophysical, evolutionary, epistemic)? Might the interplay between freedom and constraint itself be dialectical where limits do not hinder development but actually structure the field of possibility?

Speaker Info. & Abstracts

Johannes Wirz, PhD
Goetheanum, Natural Science Section

After his PhD thesis in molecular genetics on the Hox genes of Drosophila at the University of Basel in 1987, Dr. Wirz joined the Research Institute at the Goetheanum (Dornach). For the past two years, he has served as co-leader of the Science Section until his recent retirement. Also, from 2014 to 2025, he was a member of the board at Mellifera e.V. in Rosenfeld (GE) and coordinated bee research projects. He publishes regularly, gives seminars and lectures on modern and Goethean science, as well as Anthroposophy, the biology and life of honeybees, in international settings ranging from the US to Europe and China.

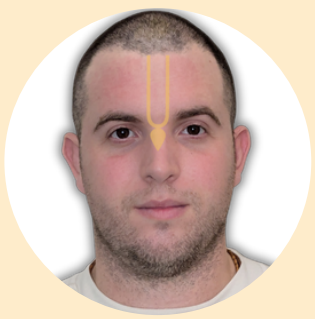
TOWARDS A NEW BIOLOGY OF LIFE: ON THE LOSS AND THE REDISCOVERY OF PLANT AND ANIMAL WHOLES

The advancement in biology must be read as the cultural evolution of mankind. “The feeling for the organism” – to use the title of Evelyn Fox Keller’s biography of Barbara McClintock – has been the conceptual ground in biology for centuries and has persisted until today.

Mainstream science, however, has made an amazing turn away from the phenotype to the genotype, or in modern times from proteins to DNA. The discovery of the double helix structure of DNA in 1953 marks the beginning of the era of molecular genetics and biology. Concomitantly, the central dogma of Watson and Crick is so to speak the dark shadow in which the phenotype has lost its pivotal meaning and has become the mere realization of a genetic blueprint.

With the advent of the human genome in 2003, this central dogma has begun to fall apart. The phenotype returns and becomes the director of the molecular symphony orchestra including mobile genetic elements, molecular chaperons, epigenetics and genome wide associations. The recent step has been the integration of microbes and microbiomes in nature and man as capacitors not only of health and resilience but also of evolution.

It will be outlined how the detailed analysis of molecular and cellular processes is urging the reformulation the role of the phenotype into a modern holistic concept of the organism.



Krishna Keshava Das
Princeton Bhakti Vedanta Institute

K.K. Das is a researcher and serving assistant to Dr. B. Madhava Puri (1943-2025) since 2018. He majored in liberal studies and held double minors in sustainability and philosophy/religion during a non-traditional undergraduate experience at Stockton University from 2012 through 2025. Current services with the BVI include organizing the annual Science & Scientist Conference Series, facilitating community programs sharing Bhagavat Culture, and publishing interdisciplinary academic articles exploring the origin, purpose, and evolution of matter, life, consciousness, and self from the perspectives of Eastern (Bhagavat Vedantic) and Western (Hegelian) wisdom.

THE DIALECTICS OF NICHE CONSTRUCTION & BIOMIMICRY

It has been argued that traditional Niche Construction Theory (NCT) overemphasizes the quantitative aspects of the reciprocal dynamic between organisms and the environment, such as objective transformations of the environment, including coral reefs, beaver dams, and nest or burrow-building. There is a call to recognize "experiential niche construction," where the qualitative experience and subjectivity of the organism is considered, i.e. the underlying meaning and purpose driving their activities in relation to the environment. The conception of G.W.F. Hegel complements such efforts. This allows us to consider more subtle phenomena such as affordances, and leads to a dialectical perspective of niche construction's inner workings, where recognizing that the organism-environment dynamic is inherently an identity-in-difference has deep implications for humanity's relation to nature. Such implications establish a philosophical foundation for biomimicry as a sophisticated form of niche construction.

The external environment not only presents options for organisms to exploit, but is also shaped by organisms' experience and activities, both historically and presently. Organisms self-determine themselves by assimilating otherness – their surroundings, including abiotic and biotic entities – to their unique needs for survival. The (subjective) habits of organisms inhabiting particular (objective) habitats create niches, which, in turn, sustain their lives. This is an interpenetrating, dialectical, and circular relation that is irreducible to the mere objective determining the subjective, or vice versa. The innate action potentials within the external environment offer affordances – ways for subjects (organisms) to use objects – based on their unique capacities. In the human form of life, affordances include exploring how the (1) forms, (2) behaviors, or (3) overarching systems of life on Earth can be biomimetically utilized to establish sustainable and regenerative niches for humanity in harmony with nature.

David Angeler, PhD
Museo Nacional de
Ciencias Naturales (CSIC)

Julie Maybee, PhD
CUNY Lehman College

David G. Angeler is Research Professor at the Museo Nacional de Ciencias Naturales (CSIC, Madrid, Spain), Adjunct Professor at the University of Nebraska–Lincoln (USA) and Honorary Fellow at Deakin University (Australia). His work bridges ecology, philosophy, and governance, focusing on resilience, complexity, and transformation. Co-author (with Julie E. Maybee) of Dialectical Ecosystems (Advances in Ecological Research, 2025), he explores Hegelian, Gödelian, and process-relational frameworks for understanding the dynamics of nature and mind in the Anthropocene.

Julie E. Maybee is a Professor of Philosophy at Lehman College, City University of New York (CUNY). She also founded Lehman's interdisciplinary Disability Studies Minor. She is the author of Making and Unmaking Disability: The Three-Body Approach and Picturing Hegel: An Illustrated Guide to Hegel's Encyclopaedia Logic, as well as articles in Disability Studies, African philosophy, educational theory, race, and 19th century Continental philosophy. Her work is united by an overriding interest in the way socially defined differences and time and place shape people's identities, knowledge and experiences.

DIALECTICAL ECOSYSTEMS: RECONCILING OPPOSITES IN THE SCIENCE AND PHILOSOPHY OF LIFE

This talk introduces dialectical ecosystems, a synthesis of Hegel's dialectical philosophy and modern ecosystem science. Drawing on Hegel's insight that reality evolves through the tension and reconciliation of opposites, it reinterprets ecological systems as intrinsically dialectical, where conflict between stability and change, adaptation and transformation, or creation and decay generates emergent higher-order regimes. Ecological resilience, often treated as a property of equilibrium, here becomes a dynamic process of sublation through which ecosystems preserve and transcend prior states. Examples from shallow lakes and transitory wet-dry systems illustrate how clear/turbid or wet/dry oppositions give rise to hybrid regimes that embody both continuity and novelty, paralleling Hegel's speculative moment in which contradiction yields a richer unity. By situating ecological science within this dialectical logic, the framework bridges mechanistic reductionism and process-relational thought, revealing nature's creativity as a self-organizing principle rather than an externally imposed law. In this sense, ecosystems can be viewed as living expressions of reason's unfolding in nature: a natural dialectic linking the biophysical and the moral, the empirical and the philosophical. This approach invites a renewed conversation between science and spirituality, showing that the logic of life itself mirrors the movement of thought: an ongoing reconciliation of difference toward ever-deeper unity.

Darrell Arnold, PhD
Miami Dade College

Dr. Darrell Arnold is editor of Traditions of Systems Theory (Routledge) and Critical Theory and the Thought of Andrew Feenberg (Palgrave/MacMillan). He has numerous translations from German into English including Naturalistic Hermeneutics (Cambridge UP) and Media of Reason (Columbia UP). From 2014 to 2019 Darrell was president of the Humanities and Technology Association, an interdisciplinary society for the study of areas at the juncture of technology and society. He has also served the editor of the association's journal. Darrell is an Associate Professor of Philosophy at Miami Dade College. His dissertation, from the Universitaet Bielefeld, in Germany, was on the 19th Century Life Sciences and the Thought of GFW Hegel.

FROM HEGELIAN ORGANICISM TO BOULDING'S ECOSYSTEMS THEORY. BIOLOGICAL HOLISM AND SOCIAL THEORY

Influenced by 19th century life scientists, in his Logic, Georg Wilhelm Friedrick Hegel proposed a concept of an organism, which he went on to apply in describing systems from organic life systems to scientific systems to the state and the Idea itself (the system of all systems). Key to Hegel's descriptions of the concept of the system in the logic and each of these systems is that they are wholes comprised of parts that are both served by and serve the whole. In 19th century German thought Schiller and various Romantics developed similar understandings emphasizing such an organic holism.

While such organicism has continued to be influential in the imaginations of 20th and 21st century deep ecologists, numerous ecosystems thinkers have contrasted the organicist thought of earlier thinkers with ecosystems thought. Alfred George Tansley had first entered the debate in 1935, arguing that plant and animal systems should be viewed not as parts of a "superorganism," in line with the 19th century usage, but as parts of an ecosystem, a looser whole of interconnected parts than an organism. Social theorists from Gregory Bateson to Kenneth Boulding then went on to conceive of both natural and social systems not so much as organisms but as ecosystems.

This talk discusses the varying uses of the terms "organism" and "ecosystem," especially in the thought of GFW Hegel and Kenneth Boulding respectively, who apply these respective thought determinations to social systems. It explores whether as heuristics the distinction makes much difference, and whether, if we take the distinctions as more than of heuristic value, one seems more accurate than the other.

Niraj Kumar, PhD
National Law University Delhi

Areas of Interest: Administrative Law, Comparative Law, Constitutional Law, Environmental Law, Law of Evidence, Interpretation of Statutes, Jurisprudence, and Legal Theory. Deputation Assignment: Additional Registrar (Research), Supreme Court of India, attached with Hon'ble the Chief Justice of India, 03 January, 2019 to 30 May, 2021. Prior teaching positions: Faculty of Law, University of Delhi- 2006-2013. Talked about "Hegel's Dialectics and Emergence of Holistic Science" at Himachal Pradesh National Law University Shimla: https://youtu.be/eO2qQ5mVN_Q?si=6ZfoJm2_iDHItJfP

AN UNENDING TRYST FOR ABSOLUTE KNOWLEDGE

Master of Ceremonies (MC):

Yater Henry
Student at Stockton University
President of the
Science of Life Club

We welcome all thoughtful questions, comments, or concerns regarding this conference. Contact:

Krishna Keshava Das
krishna.keshava.dasa@bviscs.org
+1 (732) 672 - 5116

Kindly register for the conference to receive the Zoom link:

bit.ly/BVISCS-SS2025reg