PROJECTIONS

IS THERE A CROSS-SCALE THEORY OF REGENERATION AND FAILURE FOR COMPLEX ADAPTIVE SYSTEMS?

SANTA FE INSTITUTE, SANTA FE, NM
FEBRUARY 22-23, 2023

KAĆA BRADONJIĆ

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PROJECTIONS

An academic talk and the subsequent discussion is a public display of an otherwise mostly closed-door affair, and it exposes the complex nature of the creation of knowledge. *Projections* is a series of artworks aiming to give visual representation to academic talks, mostly on the topics of physics and philosophy of physics. In a way, each *Projection* is a field report of my experience of a talk, which itself is a multidimensional beast existing in a space that exceeds the four-dimensional confines of a conference room. The talk is diffracted by my own sensibilities and projected onto the paper in real time. Some pieces are the projections of the abstract conceptual world of our models of reality and their symbolic representations: String, Loop, Set; Zero, Asymptotic, Infinity; State, Superposition, Entanglement. Others capture the emotional and the social dimensions of the talk: Enthusiasm, Self-doubt, Bravado; Camaraderie, Conflict, Agreement; Confusion, Insight, Understanding. Most of the *Projections*, however, are half-profiles: Confinement, Freedom, Exclusion; Interaction, Interference, Perturbation; Uncertainty, Confidence, Safety.

CONFERENCE INFORMATION

Is There a Cross-scale Theory of Regeneration and Failure for Complex Adaptive Systems?

Santa Fe Institute, Santa Fe, NM
February 22-23, 2023

The applications of engineering principles of robustness and resilience have been central to the SFI community's study of complex adaptive systems. The Social Robustness program of the early 2000s made considerable efforts towards generating a theoretical framework with wide-ranging applications. Equally important to advancing the theoretical and practical understanding of the behavior of complex systems is SFI's use of concepts from statistical physics such as tipping points, phase transitions, and cascading failures – these have generated new ideas relevant to ecology, biological aging, human degenerative diseases, and assessing the risks of global climate change (and others). And finally, network-based approaches are foundational to our understanding of the behavior of complex systems as well as the mechanisms of their failure and possible regeneration.

Regeneration is another concept of increasing importance to the study of biological systems crossing scales from cells to the planet. Biological systems are under increasing stress from any number of environmental assaults and identifying what adaptive responses are possible is of increasing urgency. To date, however, there have been limited attempts to develop a comprehensive theory that places the concept of regeneration together with robustness and failure in the study of complex adaptive biological systems.

Conference Website: https://www.santafe.edu/events/there-cross-scale-theory-regeneration-and-failure-complex-adaptive-systems

FEBRUARY 22, 2022

INTRODUCTIONS

Color pencil on paper
8 1/4 × 5 5/8 in (20.9 × 29.6 cm)
February 22, 2022

MANFRED LAUBICHLER, "ROBUSTNESS, FAILURE AND REGENERATION: ELEMENTS OF A THEORY OF COMPLEX BIOLOGICAL SYSTEMS"

Color pencil on paper
5 7/8 × 6 1/8 in (14.7 × 10.5 cm)
February 22, 2022

ROSEMARY BRAUN, "MISCELLANEOUS THOUGHTS ON REGENERATION ACROSS SCALES"

Color pencil on paper
5 7/8 × 6 1/8 in (14.7 × 10.5 cm)
February 22, 2022

LUCIE LAPLANE,
"CANCER REGENERATION"

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February 22, 2022

CHRIS KEMPES, "SCALING, TRADEOFFS AND REGENERATION"

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February 22, 2022

SCOTT ORTMAN,
"REGENERATION IN HUMAN SETTLEMENT SYSTEMS"

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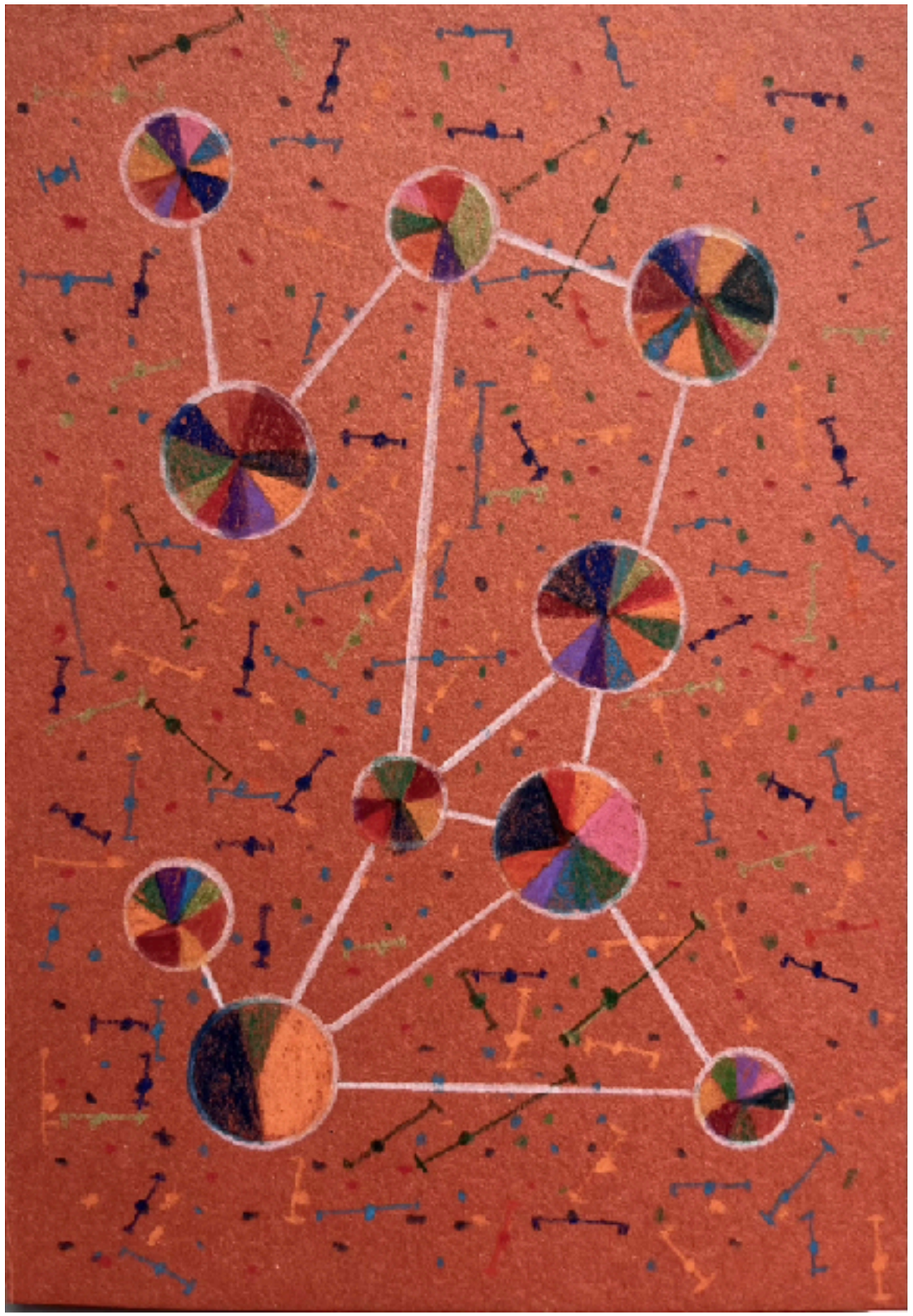
February 22, 2022



FEBRUARY 23, 2022

KAREN ABBOT,
“TYPES OF TIPPING POINTS”

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February 23,2022

MICHAEL HOCHBERG, "EVOLUTIONARY PERSPECTIVES ON REGENERATION"

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February 23, 2022

SEAN DOWNEY, "ROBUSTNESS, REGENERATION, AND FAILURE IN SOCIOECOLOGICAL SYSTEMS"

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February 23, 2022

KATHRYN MAXSON JONES,
"EXAMPLES OF AND MUSINGS ON NEURO-REGENERATION"

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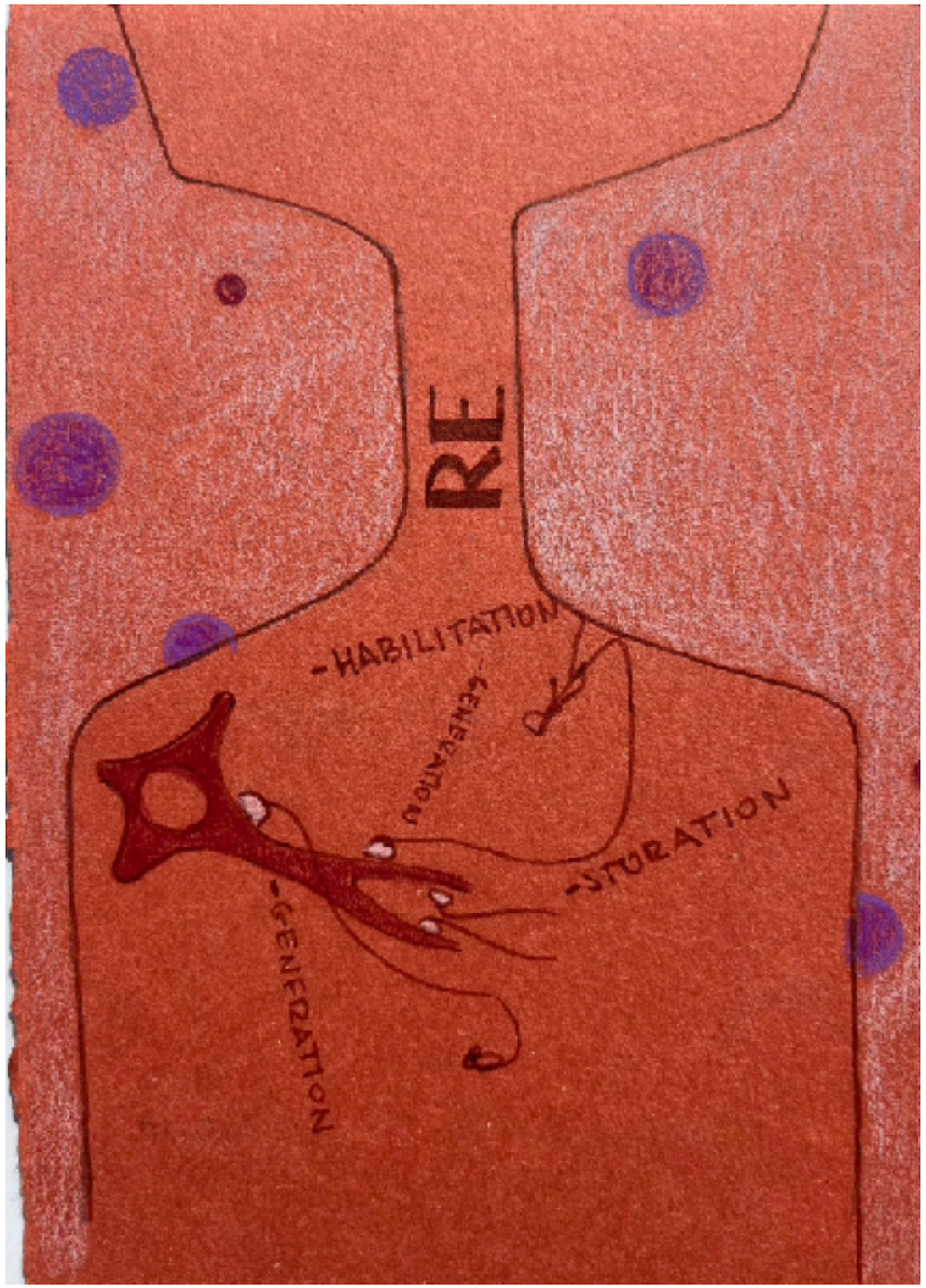
February 23, 2022



JIM COLLINS, "ECOSYSTEM REGENERATION IN A TIME OF RAPID GLOBAL CHANGE"

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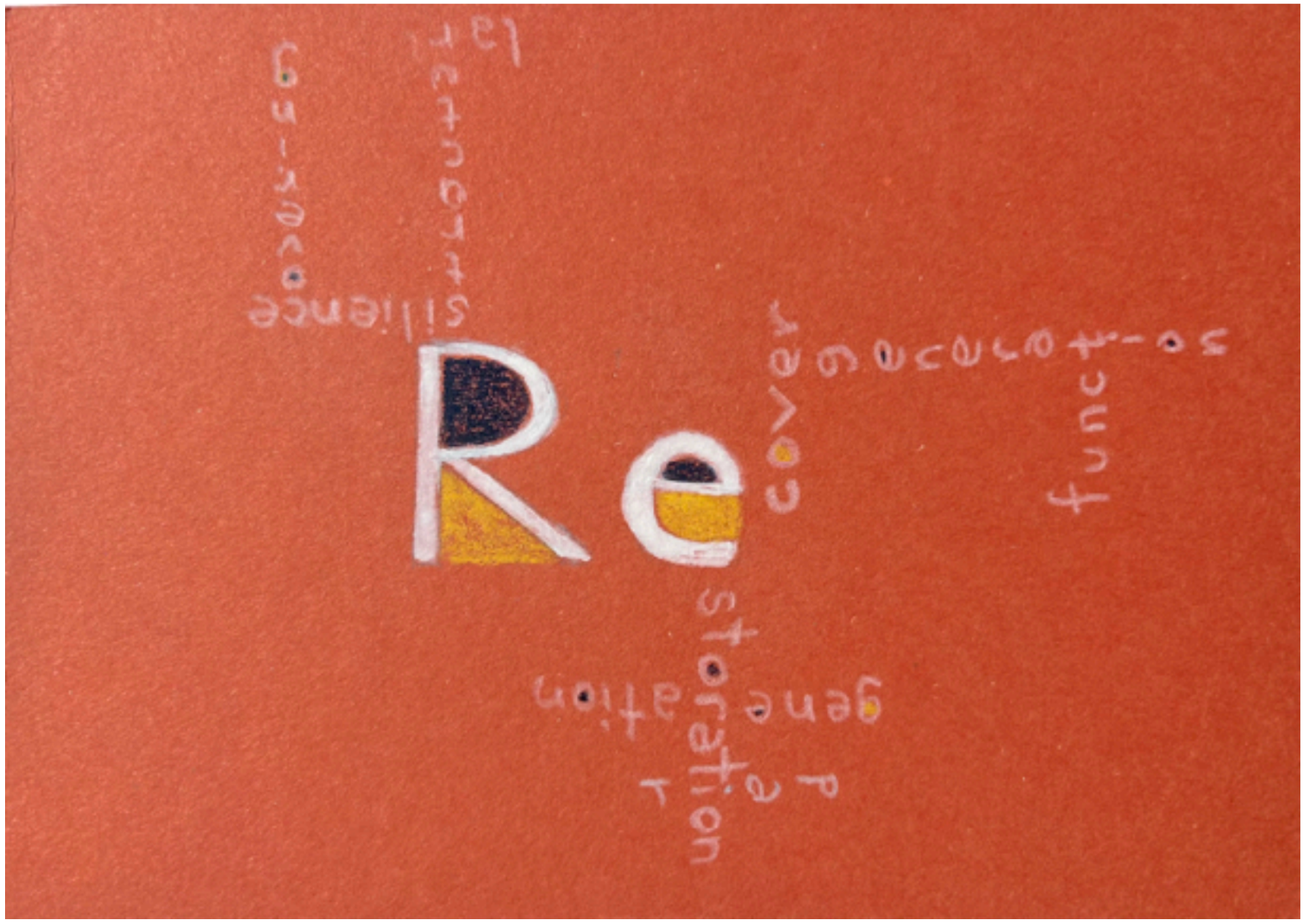
February 23, 2022



MARY O'CONNOR, "OUR CHANGING BIOSPHERE: UNDERSTANDING OUR FUTURE FROM FIRST PRINCIPLES"

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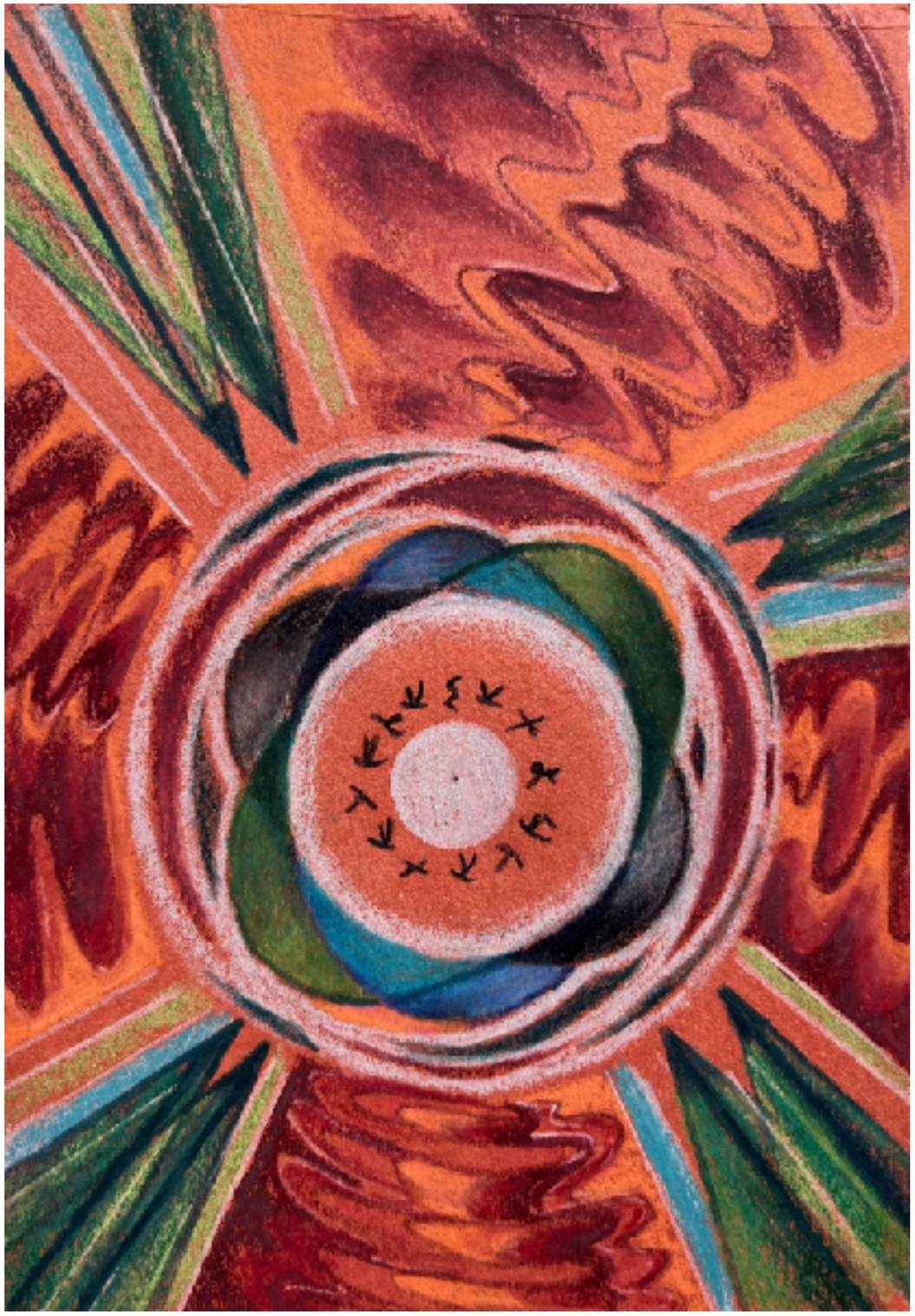
February 23, 2022



THE AUTHOR

Kaća Bradonjić is a visual artist and an Assistant Professor of Physics at Hampshire College, Amherst, MA.