

# An Artist's Navigation of the Uncertainty Principle

## Principle

Ingrid Koenig

As I write this paper, my studio is in chaos while carpenters replace rotten timbers. I live in the temperate rainforest of southwestern Canada, where entropy works at a fast pace. Although it has momentarily stalled my production, entropy is one of the indomitable forces of the universe that inspires my work.

In a series of drawings, maps and paintings entitled *Navigating the Uncertainty Principle*, I investigate a language that speaks to the complexity of our time. The scientific reference of the project title is woven throughout the work where the lens of science is used to view the resonating effects of daily existence and the poetics of scientific theories are explored through the window of the everyday.

The Uncertainty Principle was defined in 1926 by theoretical physicist Werner Heisenberg as a characteristic of the wave-particle duality in quantum mechanics. He said it was impossible to determine, at the same time, exactly where a particle is and how fast it is moving. This description of particle behaviour makes for an apt analogy of contemporary human existence. In our pressured, accelerated pace of daily life we move about ever faster. We have fragmented experiences. We lose our sense of place and self.

While seeking to understand theories of energy transformation, and even attempting to locate myself in the Uncertainty Principle, I am driven to visualize the seemingly invisible phenomenon of physics. The Second Law of Thermodynamics states that the amount of disorder in the universe always increases. In daily life, our time and energy is occupied with labours such as ordering, cleaning, maintaining, fixing; all the while "entropy" works against us. The underlying laws of the universe pervade our lives.

Diagrammatic science illustration uses the visual language of the everyday to explain abstract theories. I have incorporated this image vocabulary to metaphorically reference other aspects of our lives – aspects that seem imperceptible, yet profound. In this way a single diagram like that of a 'chain reaction' can become a forceful image to be more carefully considered. This makes it possible for me to link daily life poetically and formally to principles of science



*Chain Reaction*, 2008, Drawing, Ingrid König  
*Pressure*, 2007, Drawing, Ingrid König

as a way to navigate the abyss of devolving intelligence, fragmented experience and pressures in our current world.

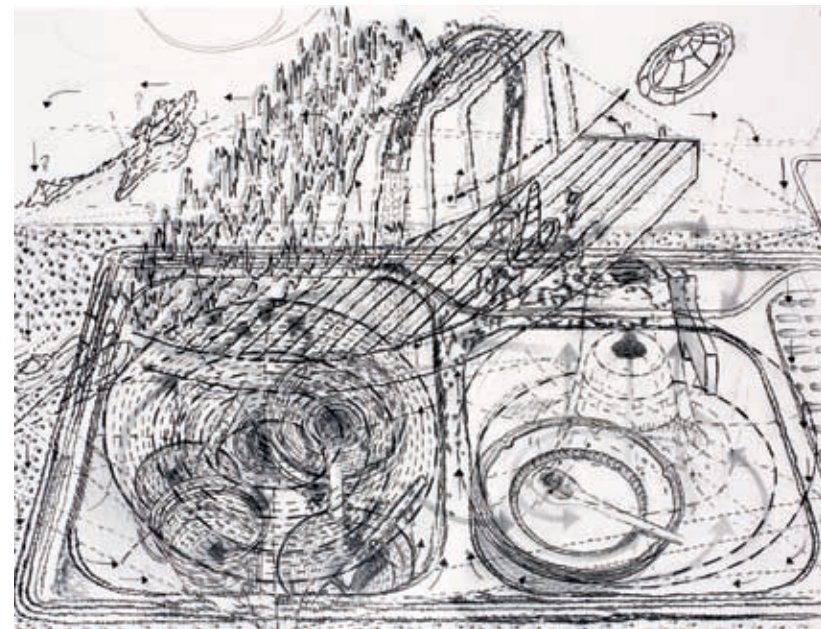
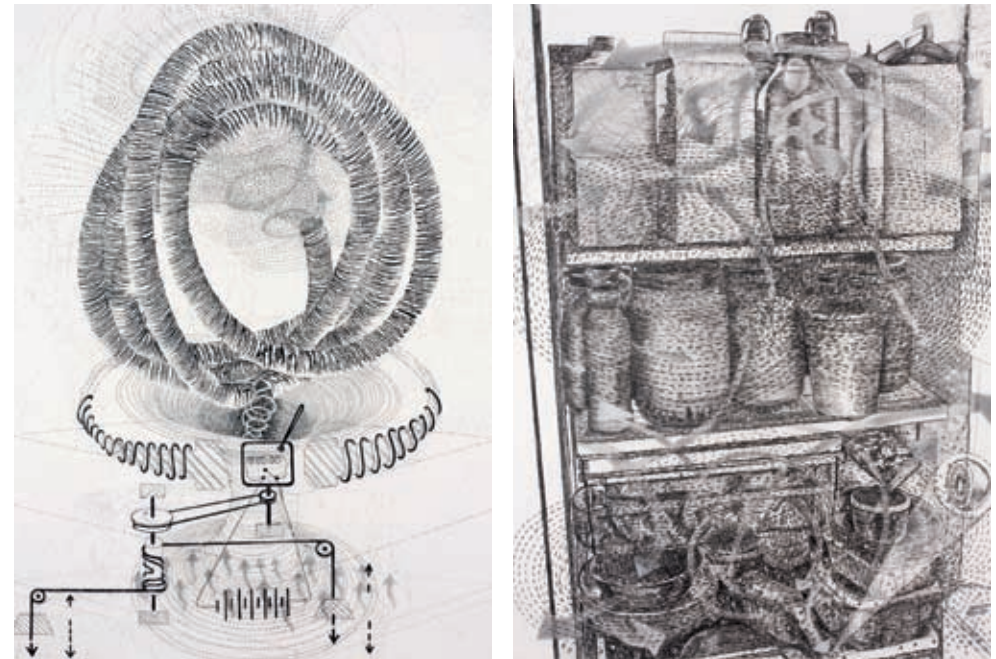
### Research

As I investigated the language of science illustration, I collected diagrams of abstract theories that describe the phenomena of physics; theoretical models such as the Black Hole, the Well-Model Bohr Atom, Time Passage, and Light Wave / Particle Duality. My reinterpretation and recoding of these abstract theories serve not only to illustrate but act as metaphor for conditions of contemporary existence. My drawings and paintings use the coded vocabulary of science imagery: of air currents, thermal movement, electromagnetism, explosive molecular pressures, and chain reactions. The interweaving of diagrams with elements of daily life interfaces what we understand as real with the abstract. This juxtaposition produces meanings of expansion, accumulation, consequence, implosion and explosion, quakes, shock, folding, squeezing, ensnarement, deluge, upheaval, massive spiraling, pressures, and obsessive and unrelenting movement. My use of diagrammatic language oscillates between factual explanation and subjective experience. The frenetic mark-making depicts powerful forces drawn in the act of moving towards their ultimate conclusion. The overall syntax produces a narrative of uncertainty.

### Process

During an artist's residency at the Banff Centre in Alberta, I laboriously reworked my collection of diagrams and imagery – blowing them up, shifting, turning, offsetting, altering their juxtapositions, rescaling, repeating them, and pushing their dynamic gestural lines further. Meanwhile the Banff studio was set in an ice age valley, surrounded by rugged mountains, signs of great physical upheaval from millions of years ago. At times, the forest swayed dramatically, a tail-end result of severe storms ravaging Vancouver. I hiked to the Cosmic Ray Station at the top of Sulphur Mountain, once used to record the rain of energetic particles from space. And I was looking at the world through the lens of physics. I was asking myself what does physics mean to me and what does it mean to the world?

In reviewing my process several issues arise; how one generates art out of information, how one comes to knowing, and how the world is in the work.



*Vacuum*, 2007, Drawing, Ingrid König  
*Circulation*, 2007, Drawing, Ingrid König  
*Quark*, 2006, Drawing, Ingrid König

### Mapping what we know and how we know

The atomic bomb is a human story as much as a physics story.<sup>1</sup> Current science discourse addresses the construction of knowledge and its global impact. Science philosopher Bruno Latour writes a profound critique that addresses the historic problem of how knowledge areas are kept in separate mental chambers. The compartmentalization of knowledge raises questions for me about styles of knowing. This has led me to investigate the complex relations between nature and human agency, which I have depicted in a series of drawn maps – “Catastrophe” and “Knowledge”. They show geophysical systems – global air pressure, tectonic fault lines, and active volcanoes, (a reminder that we live in constant movement), overlaid with human-caused destabilizing pressures in relation to science, politics, nature, and economics. Sustainability planner William Rees (originator of the term ‘ecological footprint’) addresses our daily life in the context of global effects and consequences, where we activate physics and it acts on us. He frames our existence in the science of heat and entropy. “We extract energy from our host ecosystem and dump the waste (entropy) back into our host.”<sup>2</sup> Science philosopher Michel Serres has also addressed this relationship. He crosses metaphor with science as he describes ‘world objects’ as ‘tools’ whose “dimensions are commensurable with one of the dimensions of the world...eg. A satellite for speed, an atomic bomb for energy, the Internet for Space, and nuclear waste for time.”<sup>3</sup>

### Aesthetics of Transformation/Intuitive Process

Current cultural discourse addresses how we, as artists, produce knowledge of an individual nature that conjoins the senses and the intellect. Science writer Jonah Lehrer recently argued for a stronger relationship between science and the humanities. He cites physicist Niels Bohr who considered the only non-mathematical way to explain the behaviour of electrons was through language like poetry, which Lehrer extends to works of art. “The only way to know the universe is through analogy.”<sup>4</sup> But he warns that it is necessary to take the scientific metaphors beyond this “so we can better understand the consequences of our theories ... the arts can help us reattach physics to the world we experience.”<sup>5</sup>

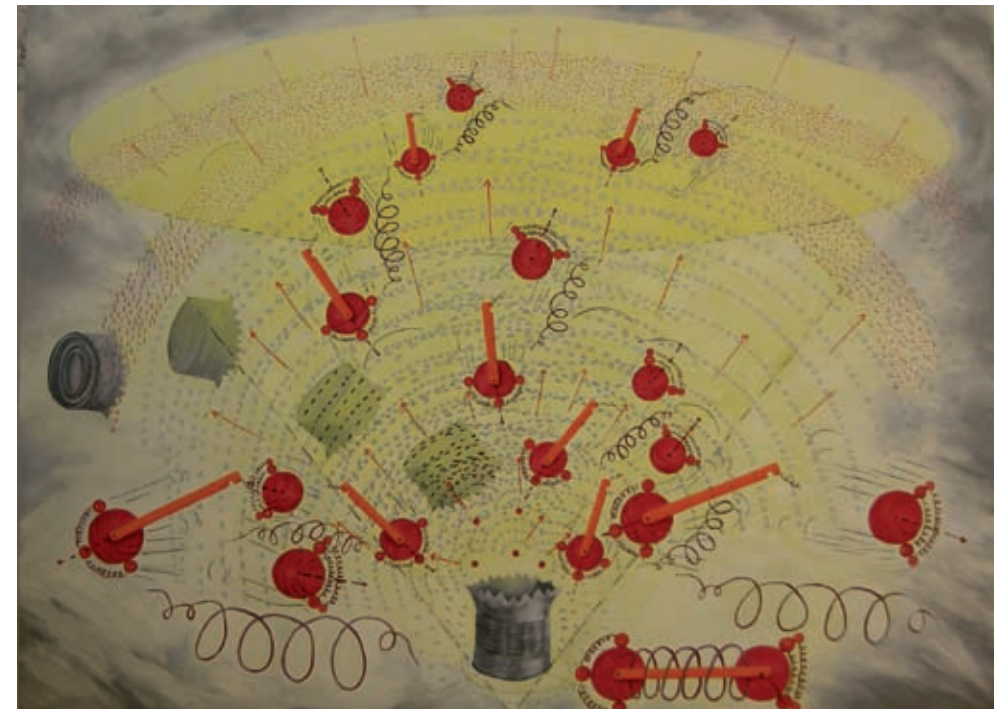
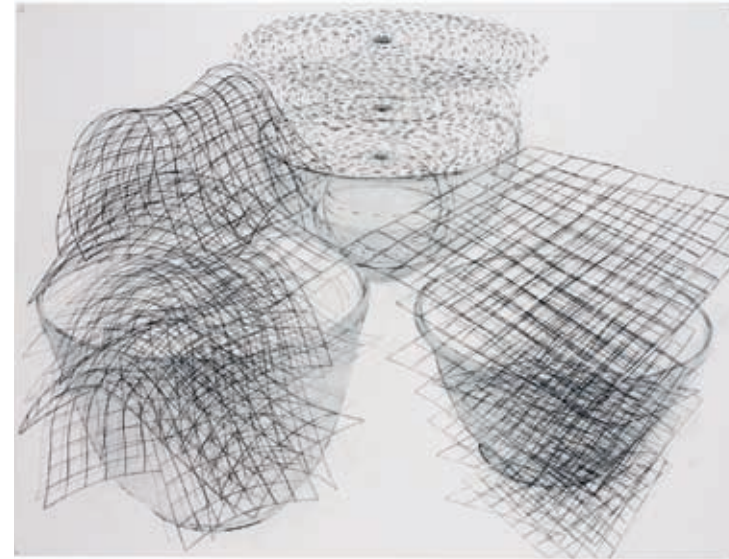
- 1 Gerald Finley, performance interview at broadcast of John Adams' *Doctor Atomic*, Metropolitan Opera, New York, 8. 11. 2008.

- 2 William Rees, “Degradation. Humanity in the Service of Entropy”, Lecture, Emily Carr University, Vancouver 5. 2. 2008.

- 3 Ebd.

- 4 Ebd.

- 5 Ebd., S. 8



*Closed, Open, or Flat Universe*, 2009, Drawing, Ingrid König  
*Explosion (Consequence)*, 2008, Painting, Ingrid König

### Aesthetics of Uncertainty

Physicist Richard Feynman, well known for his diagrams, used arrows and zigzags to “encode in visual form the assumed patterns of physical events.”<sup>6</sup> He once said that physics is a description of nature. My work in turn, describes a way of viewing physics in the context of human actions, as it examines and charts the currents of the world. The vibrations of moving shapes and resonating marks compete with scientific order, undoing the illusion that chaos is under control. It gives shape, dimension and momentum to a narrative of vicious circles, tipping points, trigger effects and uncertainty.

<sup>6</sup> Martin Kemp, *Seen/unseen: art, science, and intuition from Leonardo to the Hubble telescope*, New York 2006, S. 311.

