# INTERVIEW WITH HRVOJE HIRŠL[1]

Figure 1. Photo by Jana Mack.

[1] Hrvoje Hiršl (Dubrovnik, Croatia) is a transdisciplinary artist working at the intersection of art, science, and technology. In his work, he explores the ways natural and technological systems shape perception, materiality, and the construction of reality. He develops process-oriented artistic structures that can be initiated and guided, yet evade complete control, opening a space between determinacy and uncertainty. His practice encompasses drawing and painting, sound and light installations, performance, and immersive robotic systems. Through engagement with phenomena such as resonance, entropy, feedback, and quantum processes, he examines the relationships between the visible and the invisible, the measurable and the indeterminate. He has participated in numerous international residency and research programs and has collaborated with scientific institutions, including the Max Planck Institute for Quantum Optics (Garching) and Delft University of Technology. He was an invited participant in the AND AND AND program at dOCUMENTA (13) in Kassel and represented Croatia at the London Design Biennale (2016).

**Where does your interest in science and technology and their use in art come from? What inspires you?**

HH: I believe that art and science share the same starting point—the understanding and contextualization of the world around us and our position within it. And without technology, there is no art; all art is technological. The division between technological and non-technological art is an arbitrary one that does not actually exist—art requires a medium in order to convey a message. All media are technological. Therefore, there is no art without technology. Science is one of the key sites for the production of new knowledge, and that knowledge often becomes the foundation for new technological possibilities. My interest in science comes from the perspective of art. I am interested in the ideas and strategies that science uses in the process of understanding, and how some of them can be applied for artistic purposes. I am also interested in creating my own medium—and the best way to do that is to go to the source—where certain insights originate, which later manifest as ideas for new tools and media—and that is scientific research. Technology puts those scientific insights into practice, and entrepreneurship shapes them into products. One could say that I am interested in that first moment—before technology, and before a medium becomes a product.

I move freely within these fields, which are deeply intertwined and therefore closely related. I use all the tools and media available to me in order to create.

**A large part of your work deals with the boundaries of representation—what leads you to translate scientific concepts and physical phenomena, sometimes invisible to the human eye, into an artistic medium? What is gained in the process, and what might be lost?**

HH: In principle, I am not interested in translating scientific concepts into art; I am more interested in using them as raw material, as building elements that I can freely work with. My works are not scientific—they are deeply artistic and grounded in the history of art.

Art has always been concerned with translation, with transmission—how to transform something that lies beyond human scale and the limits of our understanding into an experience. In this, it shares much with philosophy: the pursuit of knowledge through deduction and observation—only not within a system of language, but through visual tools.

**In your work, you also rely on complex technology in the preparation and "production" of the artwork itself. In what way does this reliance on science and technology offer you something that other media and materials cannot? Is there a particular work you would highlight in this context?**

HH: Scientific ideas in my work are raw material through which I develop artistic concepts. My work is deeply rooted in the history of art and in certain fundamental

interests such as color, materiality, and representation—these are intrinsically artistic concerns. I consider them primarily artistic interests, into which I freely incorporate elements that connect with and intertwine with these enduring artistic inquiries—sometimes these are scientific quotations and fragments that I adopt as vessels for conveying my artistic concept, and at other times they are philosophical or historical.

I do not think there is any ontological difference between "other" media—by which you probably mean "traditional" ones—and those that I use. After all, my body of work also includes drawing and painting—the *Limit of Representation* cycle is a conceptual exploration of the media of drawing and painting as a study of the possibilities of depicting fragments of reality and inscribing the moment and the intangible—things that lie beyond our senses and the capacities of the medium itself. Through this, I am interested in how much art can participate in the discourse of knowledge, and whether, through very limited media and forms, it can intuitively represent what lies at the very edges of our technological capabilities. Or even aspects of reality that remain technologically inaccessible to us now—and perhaps forever—because there is also something we might call a limit of science: that it can study and measure only what it can at least partially touch. In this sense, I am also interested in ideas such as those developed by Stephen Wolfram, according to which our knowledge is always limited by the position of the observer within a system and by the boundaries of what we can compute, measure, and describe.

One of my interests lies in individuals who, throughout history, have been able to intuit something beyond their time and technological possibilities, such as Pythagoras and Lucretius—figures I have also referenced in my work so far.

As for media, in addition to drawing and painting, I have worked with sound and radio waves, as well as quantum optics and robotics. For me, there is no fundamental difference between them. Through science and technological possibilities, I try to build my own medium and tools, to expand the spectrum of possibilities. At the same time, through collaboration with scientific and technological institutions, I seek to participate in—and better understand—the forces that actively shape and construct our reality, from the technological to the conceptual and epistemological. What has become clear to me through this process is that the agents shaping our reality can most easily be divided into three categories: science, technology, and entrepreneurship. Science generates new knowledge and principles about how things function and exist; technology applies that knowledge and turns it into something usable, creating the conditions for products to emerge; and entrepreneurship transforms it into a product—that is, into an agent of social change.

I am deeply interested in the possibilities and principles of creation—the making of reality itself. And I believe this is also one of the fundamental drives of art: the creation of new realities. That is why, as much as I can, I take part in these processes—to understand them, to exert at least a minimal influence, and to discover new ways and possibilities of creation and knowledge.

**Throughout your artistic career, you have participated in many international programs, exhibitions, and residencies. How would you characterize the art scene in Croatia in relation to the European and global context? Is there a difference in institutional support for works involving complex technology in Croatia compared to abroad?**

HH: I think we have a very interesting and rich scene that largely rests on enthusiasm, given that there is no real market, and due to limited funding, only a small number of artists are active internationally. In a way, this has meant that those who engage in art are the most deeply committed to it, and the lack of market interest has further intensified that personal drive, since artists do not have to adapt to the market—simply because it does not exist.

I cannot say that institutional support does not exist, but given the complexity and scale of my projects, it would be very difficult or impossible to produce most of them with local funding alone. For this reason, the project *Is This Life?* spent the past eight years in a pre-production phase with smaller local grants, until it was finally largely funded by two organizations in the Netherlands. In a world of large financial investments, where major institutions and states invest significant resources in artistic projects, it is very difficult to break into the global scene without that level of support. High-level artistic success is almost unimaginable without substantial funding, infrastructure, and social mobility. Behind such positions stands not just an individual, but an entire system of production and support.

For example, I made my first significant sale of large-scale works to an institutional collection last year in the Netherlands, while no institution in Croatia has yet acquired my work. In addition, I still do not have a studio, and I mostly work on-site at exhibition venues or during artist residencies. I store my works wherever I can—from my apartment, which essentially functions as storage, to the Institute of Physics in Zagreb and TU Delft in the Netherlands, where I have several larger installations.

**You work across different genres and media, from painting to digital art. What does that kind of freedom allow you, and how does it relate to your interest in science?**

HH: I choose the genre and medium depending on the theme I am exploring and want to further develop through the work itself. I select the medium based on which combination of conceptual and visual elements can produce the strongest perceptual and intellectual effect, and create a work that resonates—not only with the present moment, but over a longer period of time. This is because it contains characteristics and problematics that cannot be located solely in time, but instead create a kind of mental loop that makes the work feel alive.

**You have collaborated with scientific institutions such as Max Planck in Garching or the Institute of Physics in Zagreb. Could you elaborate on this a bit?**

HH: I have been fortunate to encounter a few people whose response to my interest and persistence was to collaborate with me and help me realize my first complex works. I would especially highlight Neven Šantić (CALT, Institute of Physics, Zagreb), Teun Verkerk (Crossing Parallels, TU Delft), and Tamara Petrović (LARICS lab, FER), to whom I am immensely grateful for their support. Since then, my circle of collaborators has continued to grow. These are individuals and organizations who believe in my work, and I have had their support for many years.

**The Quantum Research Group that you founded deals with quantum physics. In what way does your work engage with quantum technologies (e.g. quantum optics)? Could you tell us a bit more about the project as a whole?**

HH: QR.G focuses on research that physicists would not normally pursue, as it does not fit within standard scientific interests or research methodologies. However, some of them are open to collaborating on such projects because they find them engaging, and occasionally interesting results can emerge simply because no one has approached things in that particular way before. My primary interest is in using QR.G as a medium for entering these structures and discourses, and only then in producing artworks. Quite often, I approach my work through the exploration of a specific topic, which then takes shape as a project I develop and build. But sometimes works also arise directly from the process itself—because, in a way, you have to start somewhere in order to see how much there is that you do not yet understand.

**When preparing your projects, do you ever think about the audience and how they will receive the work? Do you consider knowledge of the scientific background important for exhibition visitors, and do you try to make it accessible to them in some way?**

HH: In many of my installations, I set certain parameters of operation, but what happens within them is never fully controlled—it is left open. These are systems that cannot be controlled, but can be guided—because they are alive, or at least I try to make them so. I take a similar approach to meaning, which I leave partially open so that the work can absorb new conceptual interactions within its structure and thus continually reanimate itself. I always try to keep the works open, subject to interpretation, as a kind of conceptual machine that can receive new life. I also make an effort to document them well and accompany them with texts and other materials that provide certain guidelines for understanding.

I think that, although my works are deeply conceptual and layered, they also possess a strong visual language and a certain mental loop that is immediately recognizable upon first encounter. Additional interpretations and layers are there to

provide a solid foundation for those who wish to go deeper, but it is not necessary to have extensive prior knowledge in order to experience and understand them. Of course, they do not have to be for everyone.

**Has working with experimental scientific methods changed your relationship to authorship? How do you decide what to keep and what to discard when you obtain unpredictable results during the research process for a particular work?**

HH: My works *Magnetophone* and *The Politics of Numbers* in some way describe my position on authorship. *Magnetophone* addresses the relationship between computer-based binary thinking and conceptual art—specifically how the emergence of the central computer in the 1950s influenced thinking in minimalism and, eventually, conceptual art. *The Politics of Numbers* explores the relationship between abstract digital art and the geopolitical implications of quantum technologies. The work visualizes quantum processes, where the patterns evoke the structures of wave functions and reveal hidden layers of reality shaped by randomness. At the center of these abstractions lies the role of quantum random numbers, which play a crucial role in encryption, security, and the broader context of the race for quantum supremacy. I am interested in the relationship between abstraction and political influence, historically rooted in the movement of Abstract Expressionism, and in the contemporary strategic use of randomness in a new technological Cold War, where mastering randomness becomes a means of power.

I believe that both AI and quantum technologies are deeply political and conceptually shift our relationship to the human—and consequently to the artwork. What becomes completely clear in the age of AI is that the image itself is worthless; its value is defined by projected value. The image is not art—it is merely a carrier, one of many media of transmission, a container.

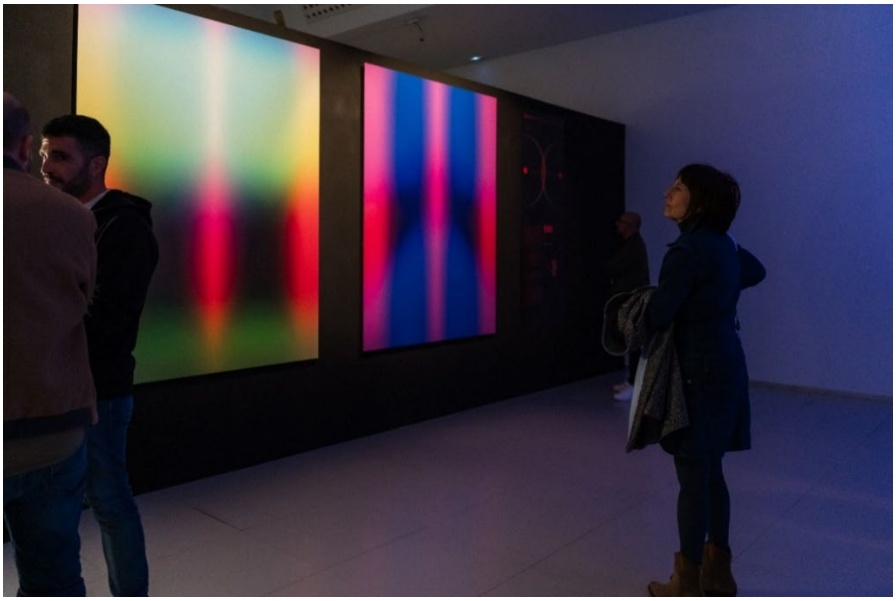

Figure 2. *The Politics of Numbers*. Photo by Jullian Falas.

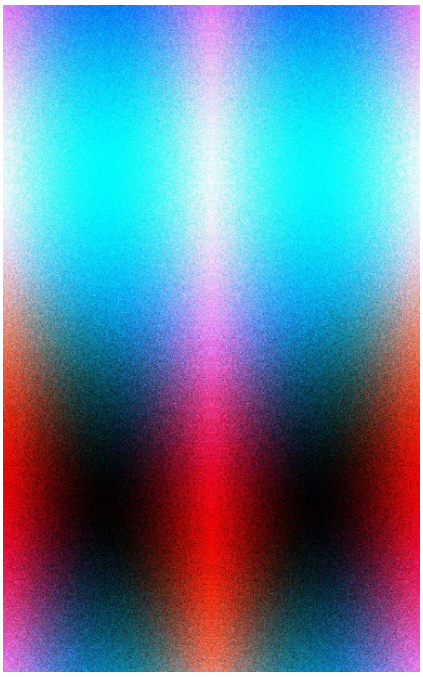

Figure 3. *The Politics of Numbers*.
Personal archive of Hrvoje Hiršl.

**Looking ahead, which new scientific or technological fields do you consider particularly fertile for future artistic projects—and why?**

HH: From a historical perspective, I would not say there are many truly "new" scientific or technological fields, given that most of what I use originates, in some form, from the early 20th century or earlier—and I often directly reference that history.

In *Sound Imprints*, I use as a starting point the research of Ernst Chladni from the 18th century. *A Star That Is Not a Planet Is the Sun and Not a Planet* draws on the letters of George Boole, the father of modern logic upon which contemporary AI tools are built. *Is This Life?* freely paraphrases Erwin Schrödinger's 1944 book *What Is Life?*, in which he introduced the idea of genetic material, preceding the discovery of DNA in 1953. *Magnetic Records* use a principle similar to early magnetic tape invented by Fritz Pfleumer in 1928, which was originally paper-based—prompting me to think about inscribing information into paper through magnetic recording. The light installation *Collapse* is based on the double-slit experiment first conducted in 1801, while *Exceptional Point* takes its title from a scientific term first used in 1902.

Figure 4. *Sound Imprints.* Photo by Žaklina Antonijević.

Figure 5. *Sound Imprints.* Photo by Juraj Vuglač.

I think this makes my starting point clear—it is artistic, historical, experimental, and philosophical, rather than focused solely on technological novelty or the mere visualization of science.

That said, among relatively newer areas, I plan to focus more on robotic sculptural objects and the use of sculptural materials in robotics—bronze, copper, ceramics. I also intend to continue exploring light and optics, based on laser light, as well as plasma, combined with vocal elements from classical music and opera. I am very interested in the relationship and complementarity between light and the human voice.

And I should emphasize that I am by no means a techno-utopian—quite the opposite. Through my research, I search for the human within these technological terms and phenomena, and I pose the question of whether it is even possible for humans to exist within such a world. My works partially serve as a medium for entering these technological environments and the structures that shape them—engineers, scientists, the financial system, and the business world—in order to explore the forces that construct our reality and to ask: is it even intended for us, and to what extent are those creating it aware of what they are doing? ⊡

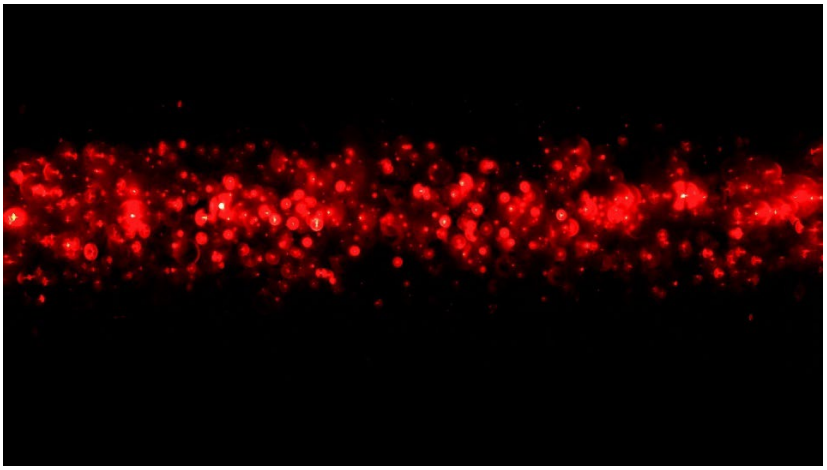

Figure 6. *Dimensions of the line.*
Personal archive of Hrvoje Hiršl.