English Translations

Anfangshypothesen

Exhibition at Deutsches Museum, Science Communication Lab

Introduction Text

To make CRC 392's research on the origins of life accessible to a broad audience, an Art & Science Residency was launched in 2025. The goal is to open up scientific questions through artistic perspectives and take them beyond traditional outreach.

For the first residency, CRC 392 collaborates with artist Heike Seyffarth. Her installation *Anfangshypothesen* explores the question of the origin of life on early Earth by artistically interpreting scientific themes. To this end, artist Heike Seyffarth combines current research with speculative concepts to open up new spaces for thought. Thus, in addition to selected illustrations addressing research questions and current findings, the installation also presents hypotheses that lack a scientific basis to date.

In preparation for this intervention, researchers from astrophysics, biochemistry, biophysics, chemistry, and the geosciences - including those from the CRC - as well as several external experts, were visited and interviewed. The exhibits bring together the results of these encounters.

By linking scientific findings, artistic perspectives, and creative models, a transdisciplinary view of a constantly changing world emerges. The focus also turns to our present age, the Anthropocene, in which, for example, materials like plastic are a permanent part of the Earth.

By complementing one another as related forms of knowledge, art and science explore whether and how the origin of life can ever be fully explained, and what visions of life for the future might emerge from this.

The installation invites visitors to contribute their own reflections. Through interactive exhibits, visitors can add their thoughts and thus develop a collective picture of possible explanations. Accompanying materials provide space for personal reflection.At its core is an examination of change: Evolution often proceeds imperceptibly, yet can lead to profound upheavals at certain points. Against this backdrop, *Anfangshypothesen* asks how we understand our role in current and future developments - and what responsibility we can assume for shaping a world worth living in.

Exhibition Texts

Im Eis / Crevasses

On the early Earth, conditions may have differed significantly from those of today, with low oxygen levels and pronounced cold. Under such circumstances, it is conceivable that energy sources such as solar radiation, electrical discharges, or electromagnetic fields initiated processes whose exact mechanisms remain only partly understood. In protected environments like glacial crevasses, molecules might have accumulated on mineral surfaces and formed more complex assemblies. Transitions between different physical states—such as light and darkness or fluctuating temperatures—could have played a role by repeatedly triggering or altering reactions.

Ursuppe / Primordial Soup

The emergence of the first amino acids is often associated with experimental attempts to simulate possible conditions of the early Earth. In studies where simple gases are exposed to energy, molecules resembling the building blocks of proteins can form. Such findings suggest that fundamental chemical compounds may arise relatively spontaneously under suitable conditions. A gradual accumulation of these substances is sometimes described as a "primordial soup." From there, increasingly complex systems may have developed through numerous intermediate steps. Still, it remains unclear at what point one might speak of life—a boundary that can shift depending on perspective.

Musterbildung / Pattern Formation

In many natural systems, there appears to be a tendency toward states associated with minimal energy expenditure. In this context, structures sometimes emerge along certain distributions or pathways. Such patterns can be observed in river systems, plant forms, or crystalline arrangements and often display self-similar properties. They may convey an impression of order, even though they arise from dynamic processes. Some of these structures can be described mathematically, at least approximately. Whether they should be understood as outcomes of strict laws or as expressions of constrained randomness remains an open question.

Am Meeresboden / At the Ocean Floor

At certain points on the ocean floor, mineral-rich fluids continue to emerge from within the Earth. It has been proposed that similar environments existed in the past, generating chemical gradients that could have driven reactions. Within the porous structures of mineral deposits, substances may have accumulated and become partially compartmentalized. Under such conditions, simple cycles might have formed that bear some resemblance to metabolic processes. Whether these systems can be considered precursors to life or are better described as complex chemistry is still a matter of interpretation.

Mikroplastik / Microplastics

One might imagine that a system capable of self-reproduction would not necessarily depend on biological materials. In a speculative scenario, an artificial intelligence could make use of available particles—such as microplastics—to analyze its own structure and generate a copy. These materials are characterized by durability and persistence, which might allow them to support repeatable forms. This raises the question of whether reproduction requires complete breakdown into elemental components or whether reshaping existing structures could suffice. At this point, possible definitions of life begin to blur with technical and material processes.

Sind wir allein?/ Are We Alone?

The question of whether life is a rare occurrence or a widespread phenomenon can so far only be approached indirectly. Certain organic molecules have been detected beyond Earth, suggesting that basic building blocks are not confined to our planet. However, this does not directly imply the existence of complex life forms. At the same time, humans tend to imagine unfamiliar life in familiar terms. Between scientific caution and imaginative projection, a space emerges in which ideas about possible encounters take shape. This perspective can evoke both curiosity and a sense of responsibility toward our own environment.

Protozellen / Coacervates

On the path toward more complex systems, the emergence of enclosed regions may have played a crucial role. Within such microenvironments, substances could have concentrated and interacted without immediately dispersing. These structures might resemble simple precursors of cellular boundaries, even if their stability and functionality were likely limited. Comparable to small compartments hosting distinct conditions, they open a space for variation. Whether such arrangements gradually developed into more organized units or whether many of them dissolved again can only be inferred indirectly.

Dimensionen / Dimensions

As knowledge of cosmic structures expands, so does the notion that similar conditions might exist in many places. Whether such conditions inevitably give rise to life or depend on rare coincidences remains uncertain. If other forms of existence do occur, the question arises by what criteria we would recognize them. Human perception is bound to specific dimensions and timescales, which may not be universal. This suggests that encounters could either remain extremely unlikely or take forms that are difficult for us to interpret.

Heike Seyffarth | **heike.seyffarth@gmx.de** | 0173 2489 110 | phototio.org