—02/01–04

Crude Oil Experiment Series

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Petrolio Rock Experiment
computed tomography
Petrolio
enigmatic stone
geology
artistic rock
metaphor

Loudspeaker Experiment
crude oil
sound
motion
Petrolio

Fingerprints Experiment
crude oil
tactility
fingerprint
identity

Color Experiment
crude oil
color
camouflage

—02/01 *Petrolio Rock* Experiment

The *Petrolio Rock* experiment, which entailed the creation of a manmade rock inspired by the book *Petrolio*, was one of a series of experiments with crude oil conducted at Leoben in 2022, employing various technologies used in the oil and gas industry. Dr Arianna Mondin, a guest participant for this series, contributed from an architect's perspective, most particularly through her expertise on how oil relates to space and shapes our everyday lives. At the outset, Mondin gave insights into *Petrolio*, the unfinished literary opus (posthumously published in 1992) by Italian writer and filmmaker Pier Paolo Pasolini (1922–75), which comprises a seemingly disparate collection of notes connected through a complex structure defined by the movement of oil.

Mondin introduced the following passage from *Petrolio*, which recounts the story of an enigmatic stone found in the desert that remained a mystery after scientists were unable to distinguish what was toxic and what was precious in it. Here Mondin found a metaphor for approaching oil in all its complexity and ambivalence:

"The geologists loaded that precious find into their Land Rover as well as they could and carried it to the civilized world to analyze it. But they do not succeed, and today that stone remains a pure enigma. The infinite variety of its soft colors corresponds to an infinite variety of materials, but none of them have really been identified, because each material presents contradictory characteristics, both in relation to itself and in relation to the other minerals with which it is amalgamated or compounded."[1]

This passage, which eventually informed every stage of the experiment, became the starting point for the construction of the manmade rock endowed with ambiguous qualities and properties, inviting participants to question positivistic assumptions about science. Logar built this randomly shaped *Petrolio*-inspired rock using

CT scanning of the *Petrolio Rock*
Department Petroleum Engineering
(DPE) laboratory
University of Leoben, 2021

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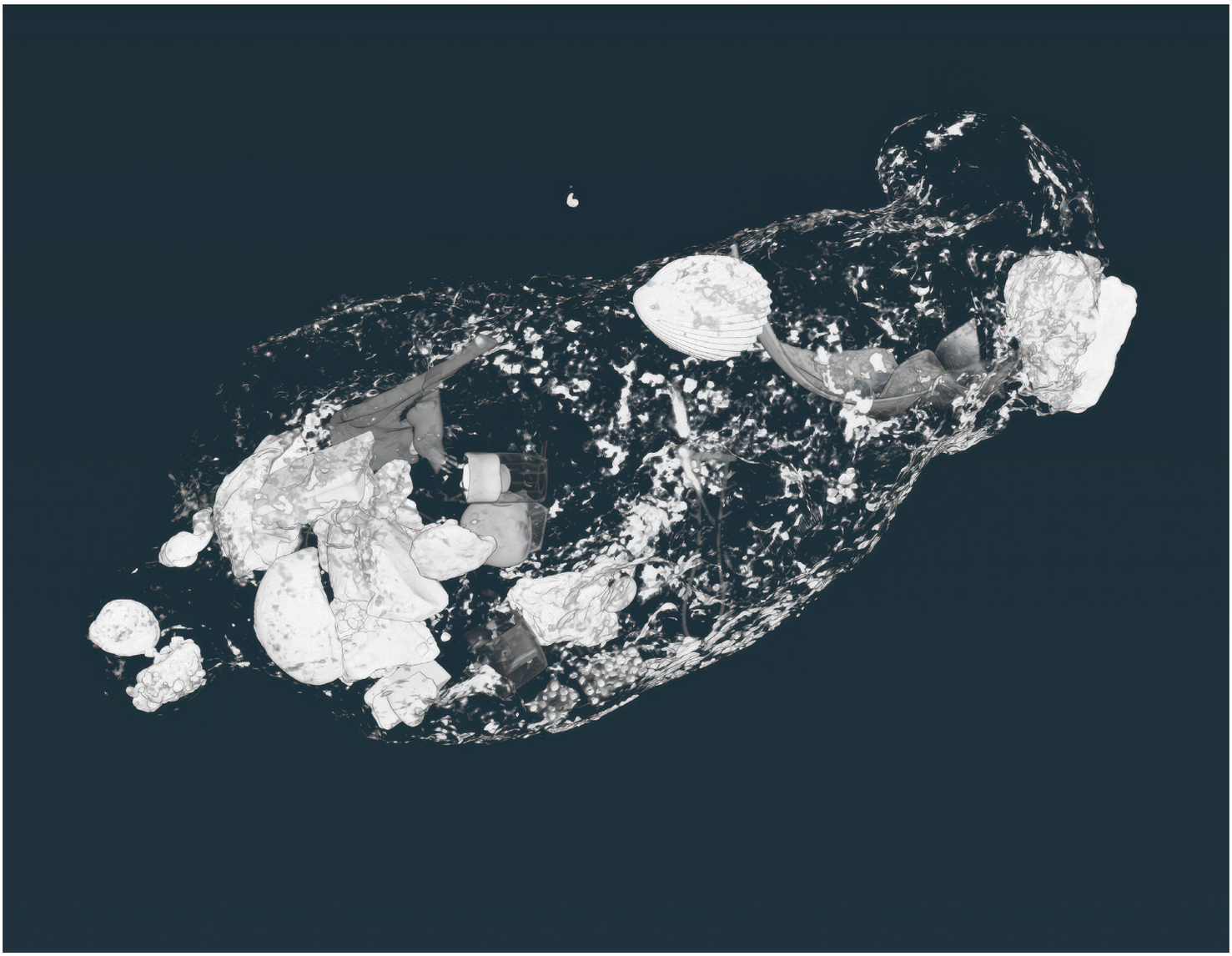
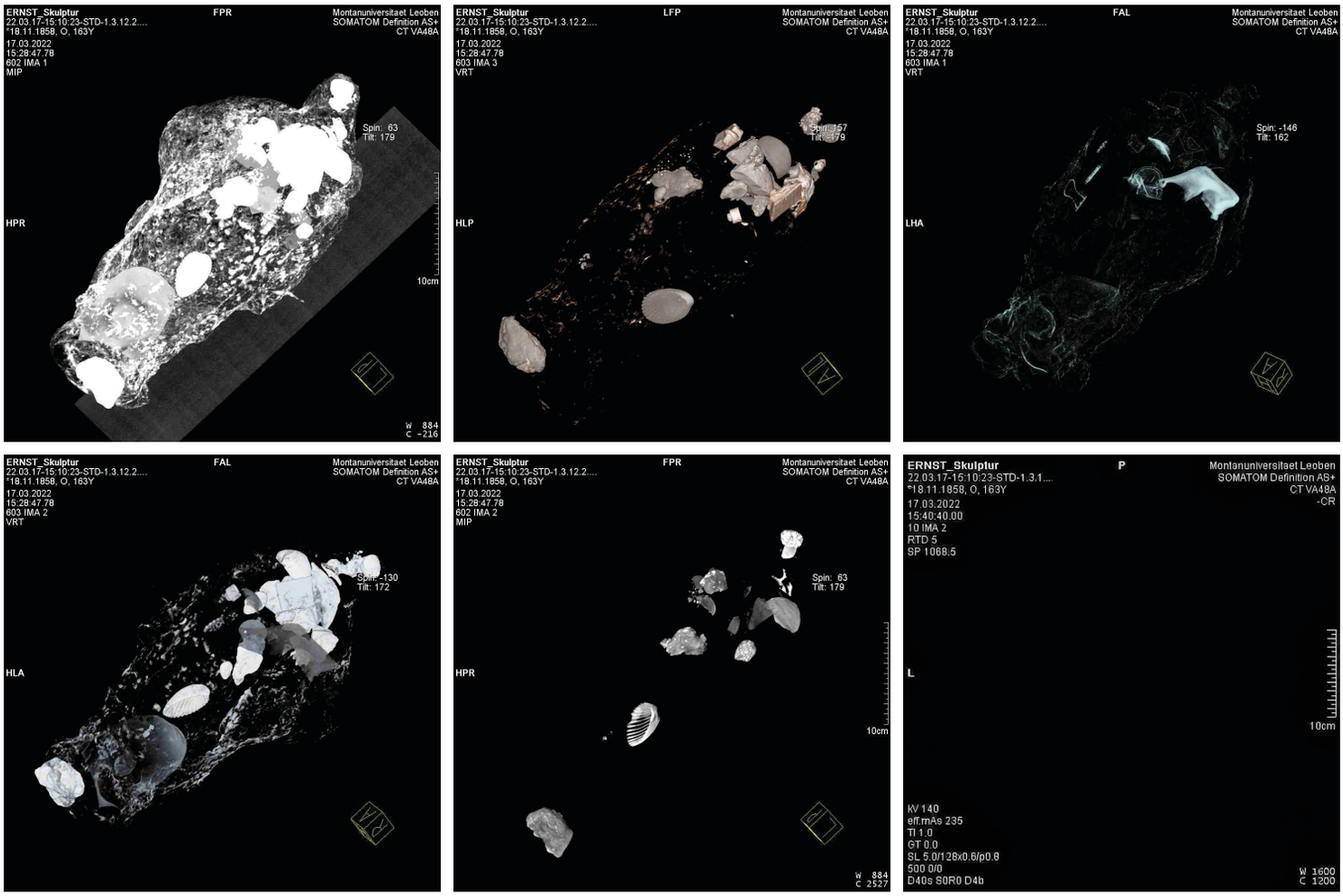


The image is a volumetric CT reconstruction of the *Petrolio Rock*, showing a heterogeneous composition.
Various embedded materials with different densities are distinctly visible, appearing as high-contrast inclusions within the foam matrix.

polyester foam, sand, and various hidden objects, like fossils and bits of plastic, which were especially selected to invoke geological and petrocultural meanings. At a later stage, a Computed Tomography (CT) scan visualized these hidden objects by detecting their different densities, without damaging the rock. The Leoben experts, upon examining the series of 3D images of the artificial rock, were quick to identify an anomaly: this manmade rock lacked the pore space and connectivity of the pores of a real rock. This abnormality ignited a creative discussion about how to bestow this artistic rock with network properties, that is, an interconnected pore structure to allow fluids to flow in it. This discussion eventually illuminated the idea of looking at networks (and their properties) from different perspectives to encourage the connection of oil with the social and the cultural, for example, becoming another potential metaphor to approach our entanglements with oil.

The oddness of Logar's rock was also recognized at a haptic level. Though it resembles a rock on the outside, it does not feel like one to the touch, as it is both warm and light. The experiment inspired participants to reflect on "scientific looking" (and its inevitable subjective angle). Despite the technological mediation, which supposedly safeguards objectivity, it is the scientists themselves who set up technological instruments (in this case a CT scan) to show them what to see.



The CT image series shows specialized post-processing filters and reconstruction techniques to enhance contrast and distinguish materials by their attenuation properties. X-ray attenuation depends on electron density and atomic composition, measured in Hounsfield Units (HU). Higher atomic number elements (e.g., metals) show greater attenuation, while lower-density materials (e.g., organic matter, soft tissues) attenuate less.

The cultural dimension behind the act of seeing the precious properties and qualities of things, in this case a rock, was also acknowledged and discussed creatively.

Pasolini expands on the above-mentioned passage, informing us that ongoing research, which is still trying to understand the mysterious stone, only gives "partiality of results," in a way that resonates with the partial, almost fragmentary quality of the image series produced by the CT scanner itself. The *Petrolio Rock* experiment, originally conceived to explore the metaphor emanating from Mondin's close reading of *Petrolio*, generated unexpected conditions to defamiliarize the material culture associated with the lab, triggering a critical conversation about oil's elusiveness and the unique contribution that artistic methods can make to approach its complexity.

1 Pier Paolo Pasolini, *Petrolio* (New York: Pantheon Books, 1997). / Pier Paolo Pasolini, Petrolio (Turin: Einaudi, 1992), 115.

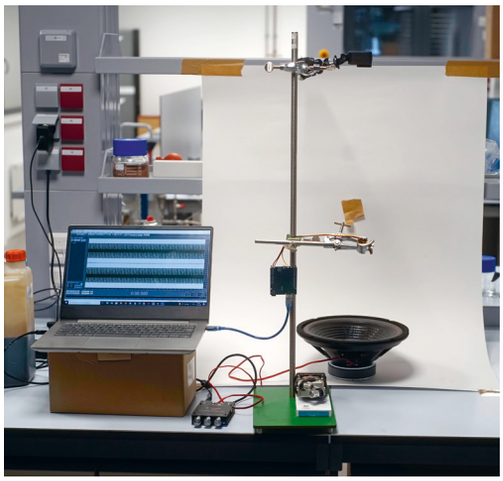
—02/02 Loudspeaker Experiment

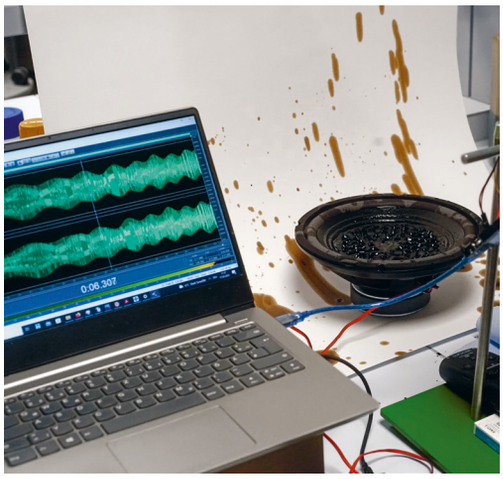
The loudspeaker experiment was another of the series carried out in 2022 that Mondin was invited to take part in. This experiment sought to explore oil surfaces in motion, a concept that Logar had looked at previously when researching the North Sea oil and gas industry, especially through his *Reflecting Oil* (2008), an installation consisting of a mirror made of moving oil. In that art piece, a pump made the oil move, whereas here sound was used to create motion. Geologists commonly use sound as a subsurface parameter and, like light, it is often deployed as an explorative tool. Geologists collect subsurface sounds and analyze them with software to help them visualize the porous medium quantitatively.

Once again, Mondin contributed to setting up the experiment with her expertise on *Petrolio*, a novel that Pasolini had conceived from the outset as being in transformation, a magmatic form of reality in constant movement. The magmatic concept and sense of motion that Pasolini strove to evoke through his writing provided the germinal idea for this experiment that offered a creative interpretation and materialization of Pasolini's approach to oil.

The experiment involved the use of a sound generator, an amplifier, a laser beam, and a loudspeaker filled with crude oil. After trying a range of high and low frequencies, the team decided that the lower frequencies came closest to creating an effect that fitted Pasolini's vision: 10 hertz and below (frequencies inaudible to the human ear) triggered vibrations that not only made the oil move, and emit sound as it moved, but generated regular patterns that made the oil look as if it were boiling. Mondin equated this regular pattern formation with what Pasolini referred to as a "swarm" movement that made the substance look alive; or, in Mondin's own words, made it appear as if it were "beating like a heart and moving like monsters of the deep."

A red laser was directed towards the surface of the oil and a laser beam was emitted and projected onto a makeshift paper wall, following the movement of the oil to create an enhanced visual effect. The oil spurted as it moved in various directions, hitting the paper in a way that recalled Jackson Pollock's action painting. Participants reflected about the striking effect caused by this visualization of oil's animation through sound in terms of an enigmatic manifestation, which felt as if oil, a non-living substance resulting from ancient life, had been awakened by a primordial ritualistic beat. For some, it seemed as though the oil were speaking, an illusion triggered by the fact that the oil was moving inside the diaphragm of a loudspeaker. Speculative questions arose: if crude oil had a voice, what sort of voice would this be? What would a language of oil entail? Would there be a plurality of languages depending on the place of origin or other unique properties of the oil in question?





Loudspeaker experiment, experimental setting
Subwoofer, amplifier, laptop, laser diode, paper, crude oil

Participants were thus encouraged to make gender, class, and race-related issues explicit.

The loudspeaker experiment set the grounds for the exploration of scientific sonic parameters in an imaginative way. Like the *Petrolio Rock* experiment, this experiment prompted ideas for further multisensorial experiments and an open conversation about artistic methodologies' capacity to convey embodied experiences and thus ignite fresh perceptions.

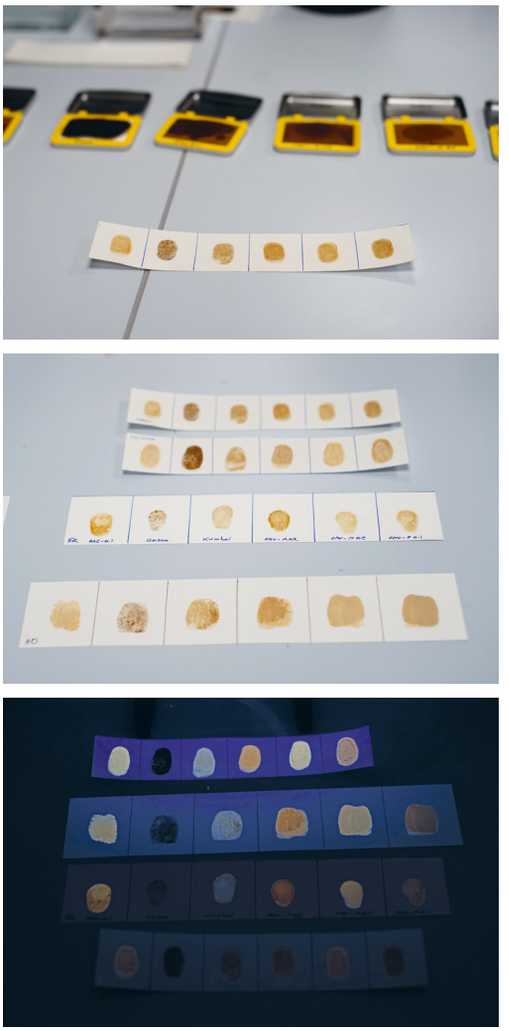
Loudspeaker experiment
DPE laboratory, 2021

—02/03 Fingerprints Experiment

The fingerprints experiment, one of a series conducted in 2023, engaged the *Reflecting Oil* research team in a haptic perception of crude oil and in novel visualizations of the substance. As a guest participant, I sought to propel the group discussion from a visual culture standpoint by focusing on what the tactility and visuality at the heart of oleaginous identity could potentially unveil about our petrocultural condition.

The starting point of the experiment derived from Logar's extensive hands-on research on oil as well as from his wish to offer others a similarly transformative encounter with the substance. As he has noted, "My experience with the substance is changing my thinking about it." Discussions with geologists also informed the experiment, in particular a conversation that followed a presentation delivered to the *Reflecting Oil* research team by Leoben geologist Prof. David Misch in 2021 about the basics of the petroleum system. Misch had spoken about how crude oils from different regions possess unique fingerprints that can actually be identified through biomarkers—hydrocarbon molecules that geologists use to determine the relative age and environment in which an oil is formed.

All those taking part in the experiment were given cotton paper strips divided into six cells. Meanwhile, six different crude oil samples—RAG (Austria), Geisum (Egypt), Kumkol (Kazakhstan), OMV-A (Austria), OMV-M (Austria), and OMV-P (Austria)—were poured onto six stamp pads. Participants then took turns to cover their thumbs with one of the crude oil samples before stamping their thumbprint onto a cell on the cotton paper strips. Participants repeated this for all six samples, making sure to wipe their hands clean between stamps. Before cleaning the oil off, however, they took time to *feel* the oil between their thumb and index finger and verbalized how it felt. Because all the oils had a distinctive smell and color, comments on the oils' tactile properties inevitably extended to their olfactory and visual qualities. The thumbprints on the paper strips were examined under UV light (often used by geologists to identify traces of hydrocarbons in rocks by making oil's fluorescence visible), revealing the participants' fingerprints to striking visual effect. The UV light enabled the group to see nuanced differences in color between oil samples.



Top: Six different crude oils in stamp pads
Center: Crude oil fingerprints on watercolor paper
Bottom: Crude oil fingerprints under UV light

Human fingerprints and oil fingerprints were amalgamated into one.

The participants were thus invited to make symbolic connections, such as between the heterogeneous identities of oil and the plurality of humankind itself. The experiment opened the floor to reflection about our identities as human beings (bestowed with unique fingerprints that are symbolically smeared by the oil-infused commodities that make up petroculture) and our ethical accountability for the carbon footprint responsible for climate change that each of us leaves upon the environment. Participants discovered in fingerprints, a concept that the Leoben experts had solely looked at as a scientific approach in petroleum exploration and refinement, a powerful metaphor to reflect creatively about our embeddedness in petroculture. The haptic experience and novel visualizations of oil facilitated by the fingerprints experiment gave participants an enhanced awareness of themselves as petro-subjects, a key step in the conception and development of a sustainable subject.

Fingerprints experiment
DPE laboratory, 2023

—02/04 Color Experiment

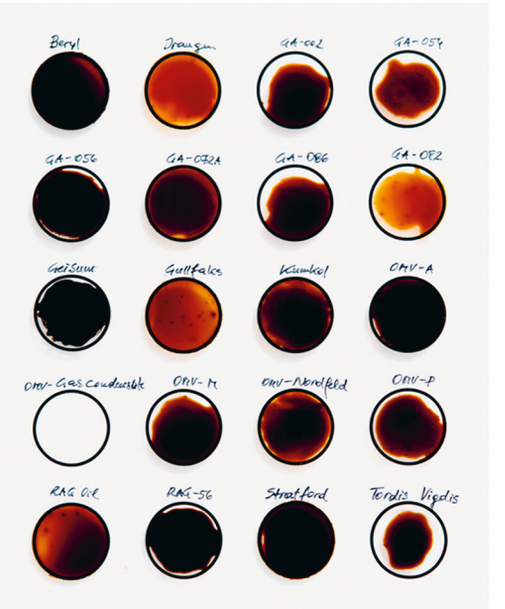
From the outset, and from an artistic perspective, Logar envisaged great potential for creative experiments on crude oil's visual appearance and aesthetics, particularly its color. Soon after the project began, when he and the Leoben experts were planning for possible experiments that would not only open room for the imaginative exploration of the physical properties of crude oil but also guarantee maximal hands-on manipulation of the substance, it became evident that the property of color did not customarily receive the same level of attention as did crude oil's other physical properties like its viscosity.

Although the Leoben experts spoke about the ASTM Color Scale[1] used to determine the color of petroleum products, both to measure quality and to indicate the degree of refinement, they acknowledged that there was no color system in place distinguishing crude oils' different black and brown tones.

It was not until the *Reflecting Oil* project was approaching its conclusion, when Logar had gained enough appreciation of the distinct visual properties of crude oils, that he was able to design an exploratory color experiment. Its execution involved 20 different samples of crude oil which were first displayed in separate glass plates and then photographed. The eventual application of additive synthesis with red, green, and blue (RGB) primaries to the resulting image allowed Logar to estimate the color of the different oil samples.

This joyfully not-so-accurate experiment makes an important contribution to the visualization of lighter and darker crude oils (an approximation of black and brown tones), constituting a meaningful effort to address oil's ambiguity. It is relevant here to mention *Six oils* (2024), an art piece where Logar alludes to the very color palette produced in the crude oil color experiment to evoke a camouflage effect that conceals instead of making visible, reminding us of the pervasive power relations and geopolitics underpinning oil's invisibility and elusiveness.

The crude oil color experiment provides a basis for what could potentially comprise a comprehensive crude oil color system able both to advance verbal descriptors of the color of crude oils and group the oils by their main compounds. By broadening the research to the physical property of color through the inclusion of cultural and artistic parameters, a nuanced understanding of the materiality of the substance could potentially be achieved alongside the promotion of inventive representations of oil capable of propelling new post-oil imaginings.



Crude oil color experiment
20 different oil samples

1 ASTM D1500-12(2017)
Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)
https://www.astm.org/d1500-12r17.html

Ernst Logar, *Six oils—Beryl oil, Draugen oil, GA-086 oil, OMV-Gas condensate, RAG oil, Tordis Vigdis oil*, 2024, Inkjet print