



PRESENTS

# “JUST RIGHT”

Water in its liquid, gas, and solid forms  
during the 2021 polar vortex

**A photo essay by Dennis Gregorious**

# Remember the tale of *Goldilocks and the Three Bears*?

In the story, Goldilocks wanders into the bears' home and samples three bowls of porridge. She declares one too hot, one too cold, and one "just right."

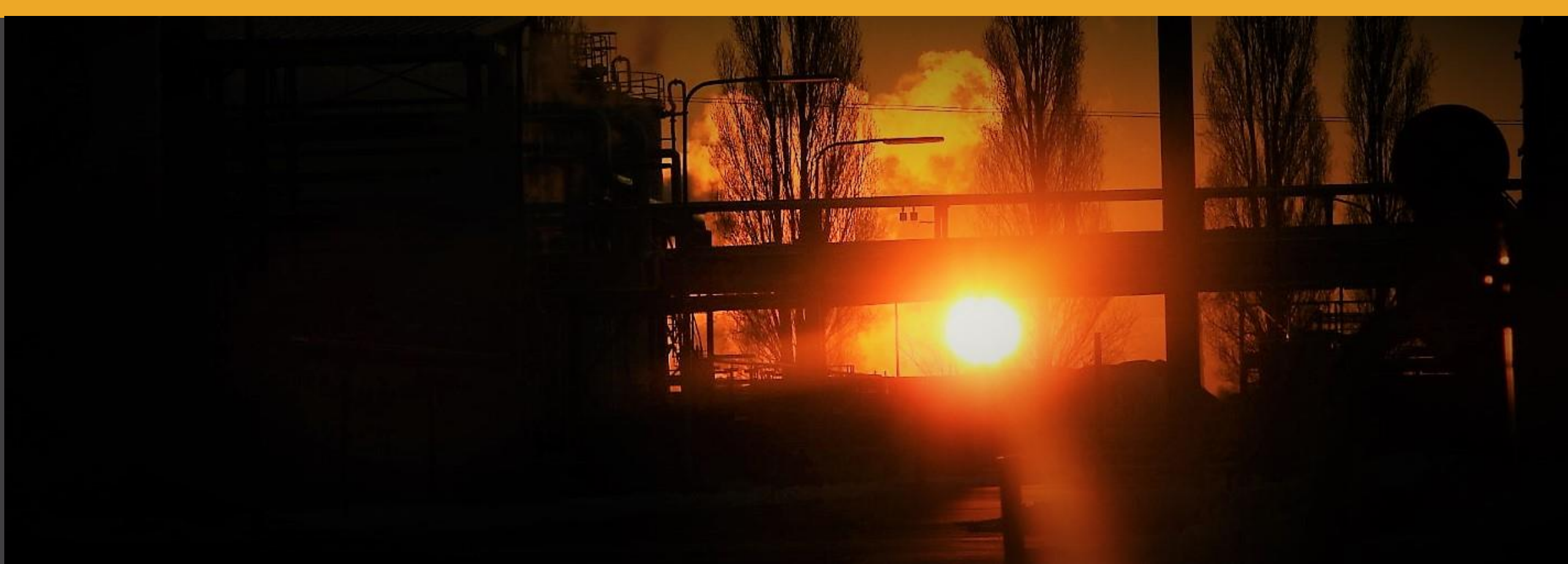
Most of our universe is either too hot or too cold for water to be present in its liquid state – a requirement for life to exist. The "Goldilocks Zone" is the very small part of the universe in which conditions are "just right" to support liquid water — and thus life. Earth (fortunately for us) sits right in the middle of the zone, while Mars and Venus exist on its outer boundaries. Earth is the only planet in the "Goldilocks Zone" with a climate temperate enough to ensure water is always present on its surface as a liquid.

During the winter of 2021, the Monument Kallo site in Belgium (along with all of Europe) experienced a sudden drop in temperature during a climate event called a polar vortex. Temperatures plunged to as low as -15C within several hours — turning all the outside liquid water around the site into ice within hours. The opportunity to chronicle the effects of the polar vortex — and to showcase water in each of its three states — proved irresistible to **Dennis Gregorius**, Kallo Field Coordinator, who has been studying and photographing space and the natural world right here on Earth, for many years.

Dennis took these photos at our Kallo site in Belgium during the winter and spring of 2021.



Venus — the "morning star" — flanks the Moon as a white dot



One hour later, the sun rises over Kallo.

S O L I D I C E





What had been a carpet of snow was melted by the sun and then transformed by plunging temperatures and gravity into shattered ice — this is what ice on the surface of Jupiter looks like.



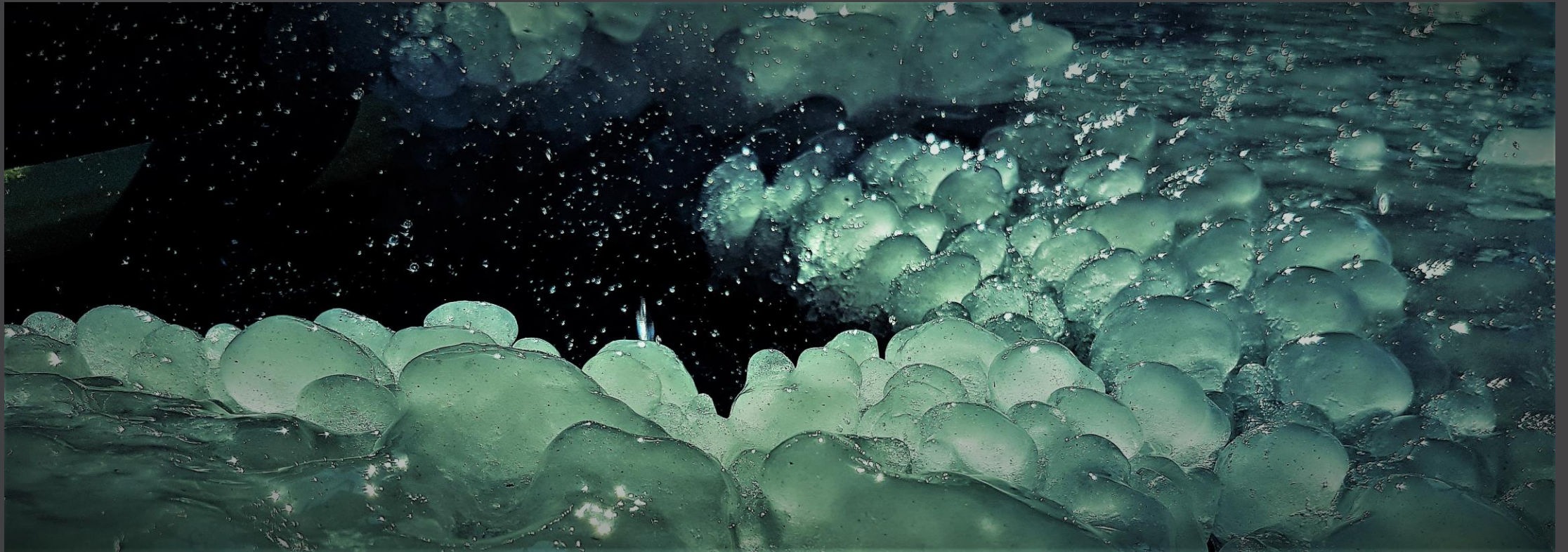
Sunlight pierces a curtain-like ice formation, creating a heavenly light.





Ice covers the inoxidable steel mantle of an after-reactor of the HMP process.





An ongoing spray of freezing water on the same spots created sphere-like shapes — “pearls of ice.”



Frozen water assumes a glass-like state.





Ice surrounds a valve.



A stalagmite of ice



G A S E O U S V A P O R



A cloud of steam near a distillation column.



Steam rises with the elegance of immaterial curtains.



Steam created by a living star — our sun.





Water evaporates — becoming gaseous — before cooling down and condensing again.

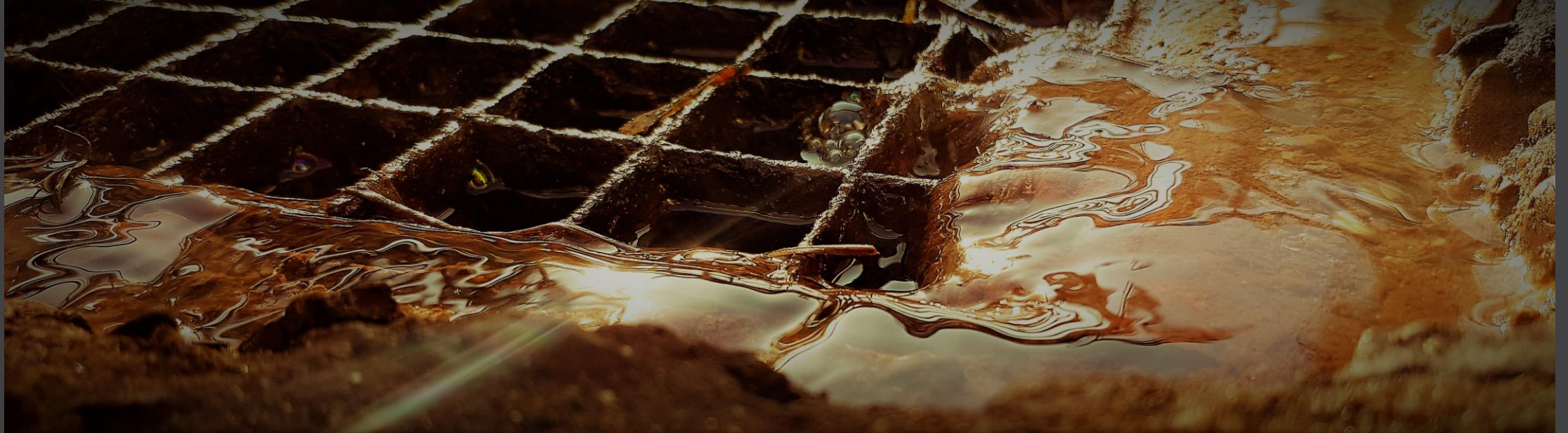
L I Q U I D W A T E R





Water in its most familiar and useful form.





”Molten ice” flows into a gully.





Once it has released all its kinetic energy, water will remain liquid under the force of gravity and atmospheric pressure. Water's shell electrons reflect solar photons — sunlight — which we experience as a mirror effect.





What might look like the 100 billion stars of the Milky Way is actually falling water right here on Earth.





Drops of rain run down a window, pulled by gravity toward the center of our planet.





The immense forces of water, air, heat, and cold can combine to seriously erode concrete.





Algae formed in a pool of water behind a storage tank, releasing oxygen that enriches our atmosphere.



It took one billion years — one billion circles around the Sun — before life left the ocean and plant life began colonizing our planet's surface and pumping huge amounts of oxygen into the prehistoric atmosphere. Plants like these around Tankform 3 fulfill this process today.





Step by step, plants covered Earth's surface. An overgrown sandy area near Tankfarm 15 had the right conditions to create a microworld — a miniature Iceland in Kallo!





Over time, forests began to evolve and creatures of all kinds were in perfect symbiosis with them and each other. This colony of rare umbrella moss grows in a silent corner of our scrapeyard.

# VIEW UPON THE SOLAR SYSTEM





Sunrise, June 21. We are closest to our star — the sun— than on any other day of the year.



Driving home after work, I stopped to photograph a unique triple planetary alignment and view three planets with the naked eye. Jupiter is in the left upper corner, 690 million km away. The faint dot in the center is Saturn, 1 billion km away. And Venus shines in the lower-right corner from 70 million km away. The red glow comes from a type of street light designed not to disturb bats.



With sudden fog as a natural filter, I was able to snap this shot of the Sun on December 21, when it is farthest away from us. Because of the fog, “solar spots” – cooler regions on the solar surface – were visible. The small black spot right on the Sun’s surface is about Earth’s size.





Heated by the proximity from our parent star...



...under the merciless blast of light and radiation.



# EPILOGUE



Sunrise shot from near a steam boiler close to Tankfarm 3. I had to wait a few minutes before having the Sun's chromosphere right between the horizon and feed lines.



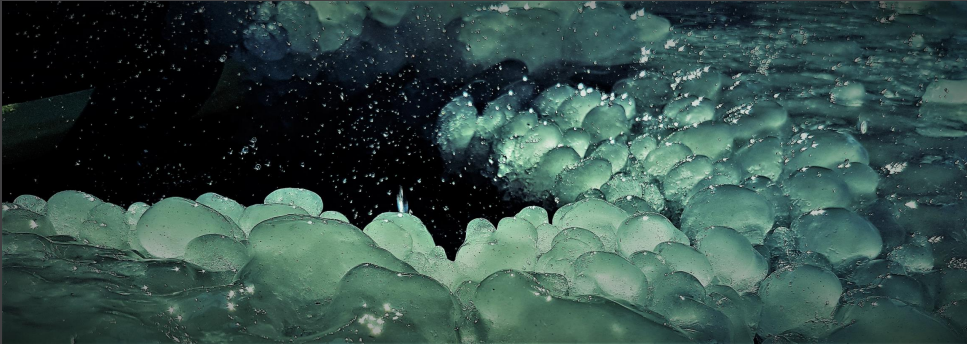
A layer of deformed snow between additive storage and the contractor hall. A lucky shot because of the position of solar light, right on top of the ice. This creates a dramatic tension. Five minutes later, the sun was gone, making this subject far less attractive.



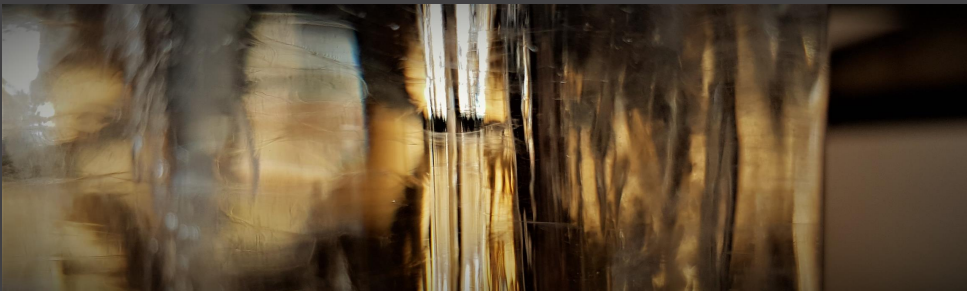
Curtains of ice near a condenser water leak at the loading area of Tankfarm 2. These ice formations formed pillars from a piperack towards the ground. The countering light charmed me instantly and inspired me to snap this close shot.



Ice stalactites hang over the dome of a reactor built for HMP production. I was charmed by seeing crystallised water covering crystallised, galvanised metal. The hardness of them both, the bone-chilling cold on one hand, the difference in crystalline shapes creates abstract art.



High above the ground, a leak in a cooling water line was responsible for this sudden beauty. Because of the distance they fell, the water drops exploded on the ground and created this formation. I experienced both great excitement and cold knee joints while snapping this shot!



Closeup of the inner ice structure and solar light being broken by a single solid ice pillar, standing alone in the geographical centre of Tankfarm 14. In this outer region of the Kallo site, silence is golden, and the magic of the changing light between the storage tanks is next-level.

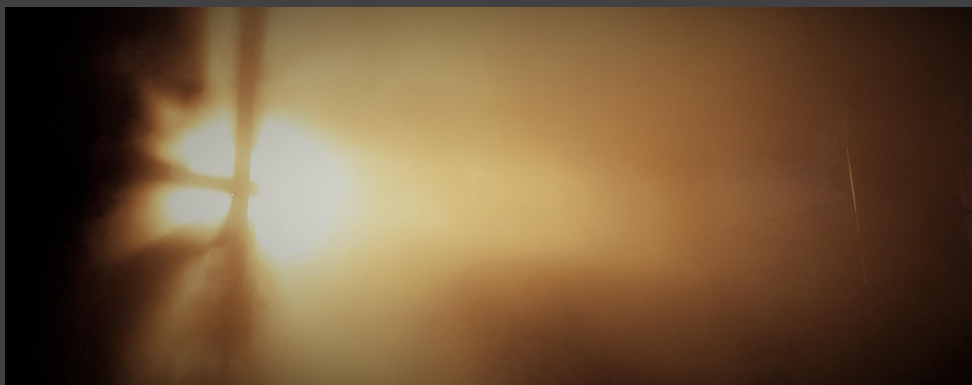




The ongoing drip of controlled water relief caused a spectacular interchange between the organic character of frozen water and the mechanical nature of this valve in a pipe rack in Tankfarm 2.



A stalagmite of ice near tank 1217. Drops of water on the same spot created this temporary formation. Nature creates nature; she is her own artist. I positioned the camera on the ground to snap the shot.



Steamclouds near R115 created this heavenly countering light. It was difficult to find focus and sharpness, so I decided to make this a rather abstract impression.



Steam structure is visible in countering light at the plants' incinerator. At this point, the movements inside the cloud were slow and steady, a great opportunity for imaging the web-like patterns.



Near the loading area of Tankfarm 2, the dancing clouds of steam revealed the chromosphere of our star, perfectly softened by the amount of water particles.



Near the site's west gate, a lonely steam relief valve under the jetty transfer lines releases its pressure regularly, expanding condensed water, heat, and an amount of minerals. This scene inspired me immediately and reminded me of Iceland's volcanic activity.