



# ANNA LÍNDAL

Kortlagning landnáms örvera neðanjarðar  
Mapping Underwater Microbial Colonization

**Sequences XI 2023**

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Nýlistasafnið / The Living Art Museum 13.10. – 27.11.2023



**Kort sem sýnir þverskurð af Surtsey** / An embroidered map, mapping the cross section of Surtsey volcano, showing the location of borehole SE-02a, where the microcolony was identified. Based on published map by SUSTAIN 2017 science team. **Útsaumur á silki** / Embroidery on Silk, **105 × 51 × 55 cm**



**Silkiprykk** / Screen Prints  
**Stærð** / Size: **105 × 30 × 37 cm**

Sýni úr borkjarna SE-02a frá Surtsey, myndað með rafeindasmásjá (Microscope (SEM) Courtesy of M. Stephan Borensztajn (Bergsten et al. 2021). Silkiprykkinn sýna hola sem varð til sem gasblaðra á 65 metra dýpi undir yfirborði Surtseyjar og örverusamfélagið sem þrívíddarskúlptúrin var prentaður eftir.

Two Screen Prints from a Scanning Electron Microscope (SEM) showing a small gas bubble formed 65 meters below the surface of Surtsey. Courtesy of M. Stephan Borensztajn (Bergsten et al. 2021). One print shows the whole gas bubble with 6 microcolony complexes while the other shows the complex represented by the 3D sculpture.

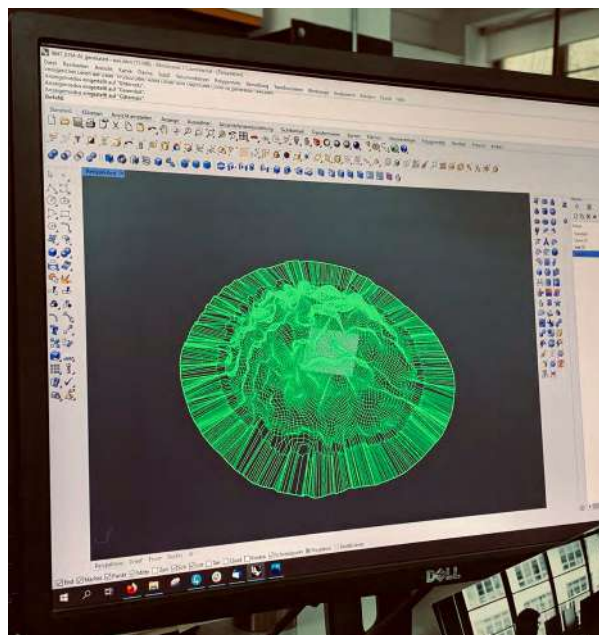


### **Polyurethane 300, þrívíddarprentaður skúlpturn**

Polyurethane 300, 3D printed sculpture 50×50×20 cm

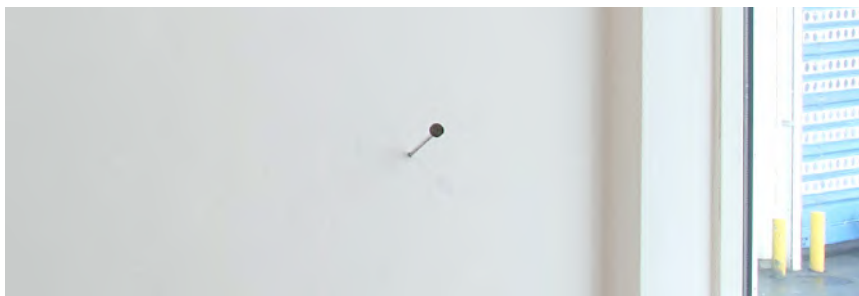
### **Þrívíddarprentaður skúlpturn af samfélagi örvera, 0,01 míkrómetrum í þvermál stækkað 50.000 falt.**

3D printed sculpture of a microcolony, 0,01 mm in diameter microcolony complex size increased 50.000 fold.



**Vinnsla á skúlpturn:** werk5 í Berlín notaði gervigreind til að umbreyta tvívíðri SEM mynd úr rafeindasmásjá í þrívítt líkan, sem síðan var grafið út í Polyurethane 300 með þremur róbótum.

3D sculpture in progress: werk5 in Berlin used AI to make 3D replica from SEM image, rebuild with Z-Brush. Three robots made the 3D-milling in Polyurethane 300.



**Borkjarnasýni fyrir rafeindasmásjá**

Drill core sample for Scanning Electron Microscope (SEM)

**2 × 2 × 12 cm**

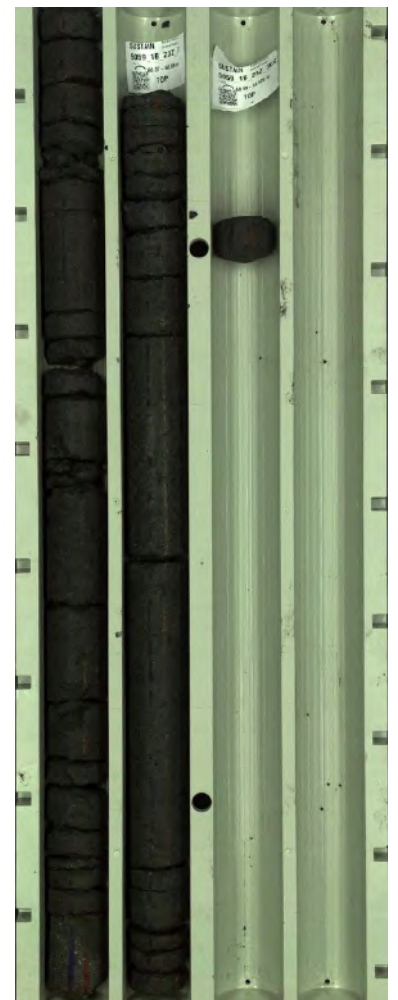


**Kjarnar úr borholu SE-02a úr Surtsey**

Drill Cores from Surtsey borhole SE-02a

**702 × 7 x30 cm**







The work Mapping Underwater Microbial Colonization (2023) is inspired by the life on Planet Earth, driven by a curiosity to explore and communicate with other beings that we share 'our' land with. It concerns a consortium of colonies of micro-organisms that form part of an underwater biome within the basaltic rock of Surtsey, an island in the North Atlantic that was formed by a submarine eruption in 1963.

Five years ago I found out that signs of microorganism were identified under the surface of Surtsey. By then I had already taken part in two research expeditions to the island and this knowledge somehow transformed my relationship with Surtsey. The works I made for Sequences Biennial are my response to this knowledge, driven by a strong desire to get a grip on something unfamiliar.

The series of artworks involved, are presented through a variety of media, including a 3D printed sculpture from a SEM image. By enlarging the image of one microcolony complex (0,01 mm in diameter) 50.000 fold, a real phenomenon that is invisible to the human eye becomes apparent. There are screen prints showing a gas bubble with 6 microcolony complexes attached, as well as the microcolony complex represented by the 3D sculpture. An embroidered map, cross section of Surtsey volcano and shows the location of borehole SE-02a, where the microcolony was identified and the Drill Core segment from Surtsey borehole SE-02a, installed from floor to ceiling in the Museum.

The works are a metaphor for what binds humans, non-human, land, earth and environment together. They were made possible by the kind permission of the science team that contributed to the SUSTAIN drilling project in 2017 at Surtsey. Special thanks to Marie Jackson, Magnús Tumi Guðmundsson, Pauline Bergsten, Pauline Vannier, the SUSTAIN drilling and science teams, and the Drill Core Library of Icelandic Institute of Natural History. Please see the Surtsey at 50 Years Blogspace (<https://surtsey50years.utah.edu/>).

Kortlagning landnáms örvera neðanjarðar (2023) er innblásið af löngun til að kanna umhverfi okkar og eiga í samskiptum við aðrar verur sem við deilum jörðinni með, sterkri löngun til að skilja áður ókunna hluti.

Í þessu tilfalli er um að ræða samfélag örvera sem numið hafa land neðanjarðar í Surtsey, eyju í Norður-Atlantshafi sem myndaðist við eldgos í sjó árið 1963. Myndir sem sýna örverurnar í lítilli holu í berginu voru teknar með rafeindasmásjá af sýni úr borkjarna. Örverurnar birtast hér sem þrívíddarskúlptúr og prentverk. Að stækka 50.000 sinnum örliða örveruþyrpingu neðanjarðar er leið til að framkalla annars ósýnilegt fyrirbæri.

Útsaumað kort sýnir þverskurð af Surtsey með staðsetningu SE-02a, borholunnar þar sem örveruþyrpingin fannst. Sjálfur kjarninn úr borholu SE-02a, var sýndur með leyfi Borkjarnasafns Náttúrufræðistofnunar Íslands og sýni sem tekið var úr borkjarnanum til að nota fyrir rafeindasmásjá. Verkin byggja á rannsóknum teymis vísindamanna innan SUSTAIN borverkefnisins í Surtsey árið 2017.

Sérstakar þakkir fá Marie Jackson, Magnús Tumi Guðmundsson, Pauline Bergsten, Pauline Vannier, bormenn og rannsóknarteymi SUSTAIN.

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**Sýningastjórar / Curators: Marika Agu, Maria Arusoo, Kaarin Kivirähk og Sten Ojavee.**

**Sérstakar þakkir fá Marie Jackson, Magnús Tumi Guðmundsson, Pauline Bergsten, Pauline Vannier, bormenn og rannsóknarteymi SUSTAIN. Borkjarnasafn Náttúrufræðistofnunar Íslands.**

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