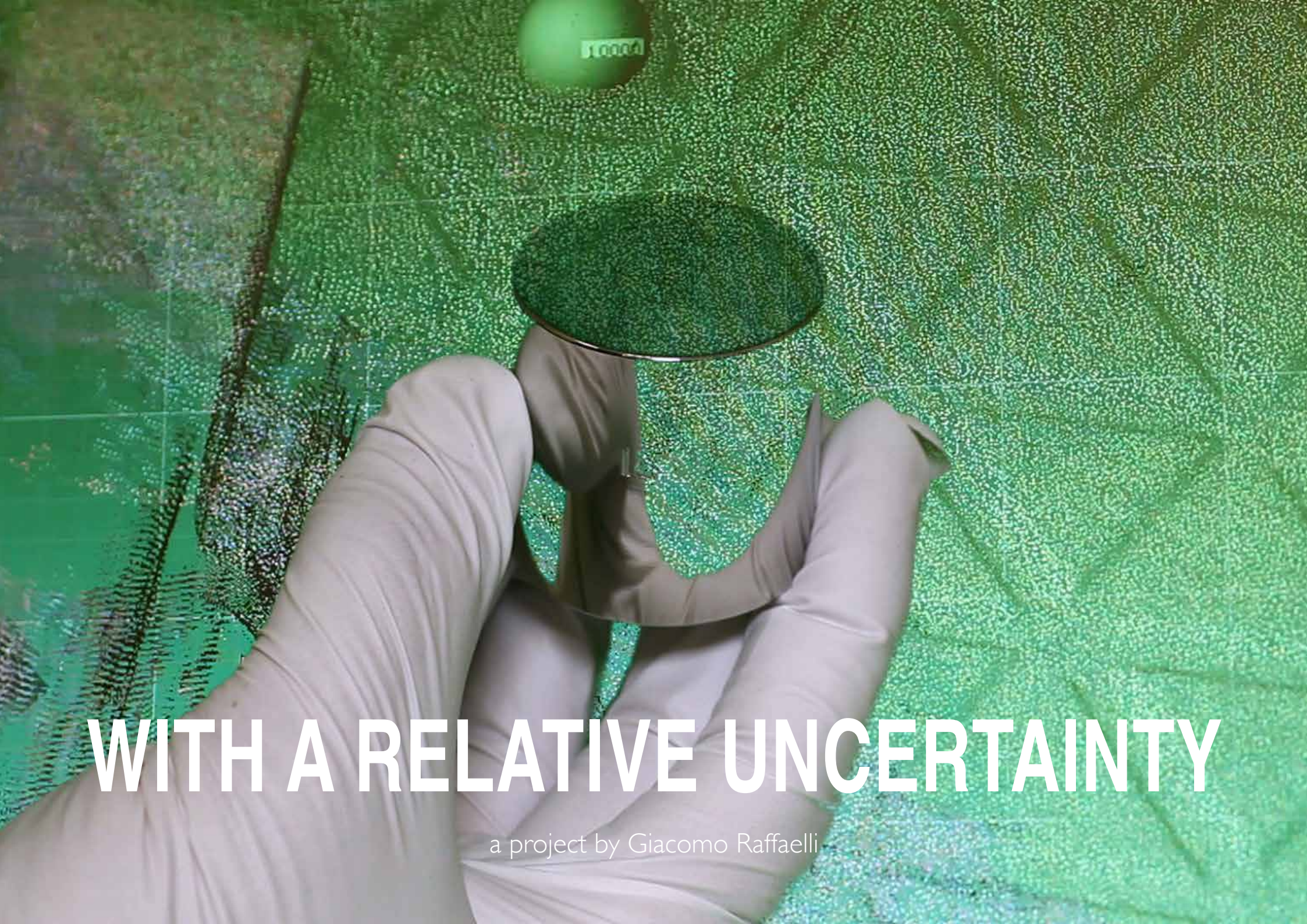
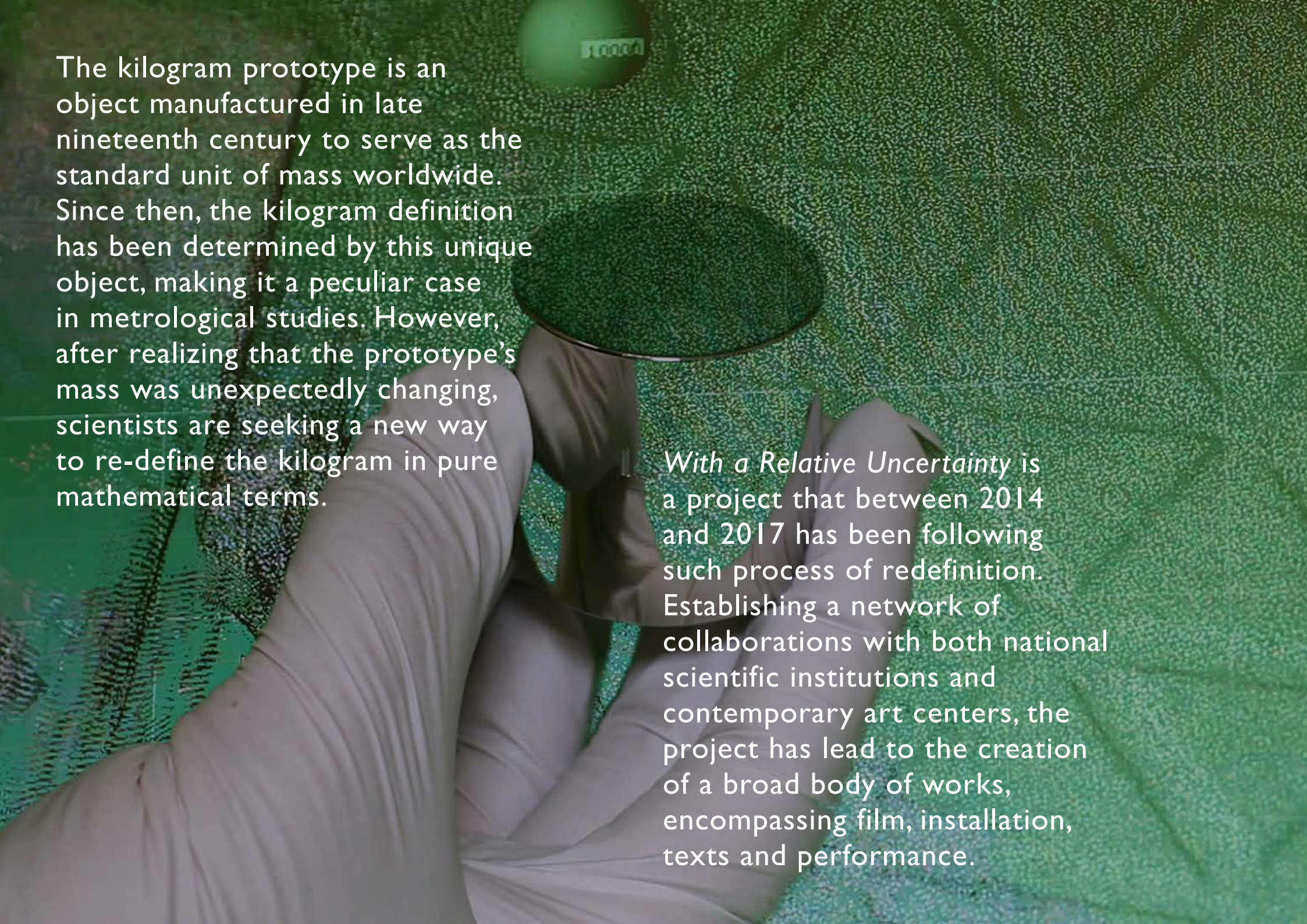




WITH A RELATIVE UNCERTAINTY

a project by Giacomo Raffaelli

A close-up photograph of a hand holding a small, dark, cylindrical object, which is the kilogram prototype. The hand is positioned in the lower right, with fingers wrapped around the object. The background is a green, textured surface, possibly a wall or a large piece of paper. The lighting is soft, highlighting the texture of the hand and the object.

The kilogram prototype is an object manufactured in late nineteenth century to serve as the standard unit of mass worldwide. Since then, the kilogram definition has been determined by this unique object, making it a peculiar case in metrological studies. However, after realizing that the prototype's mass was unexpectedly changing, scientists are seeking a new way to re-define the kilogram in pure mathematical terms.

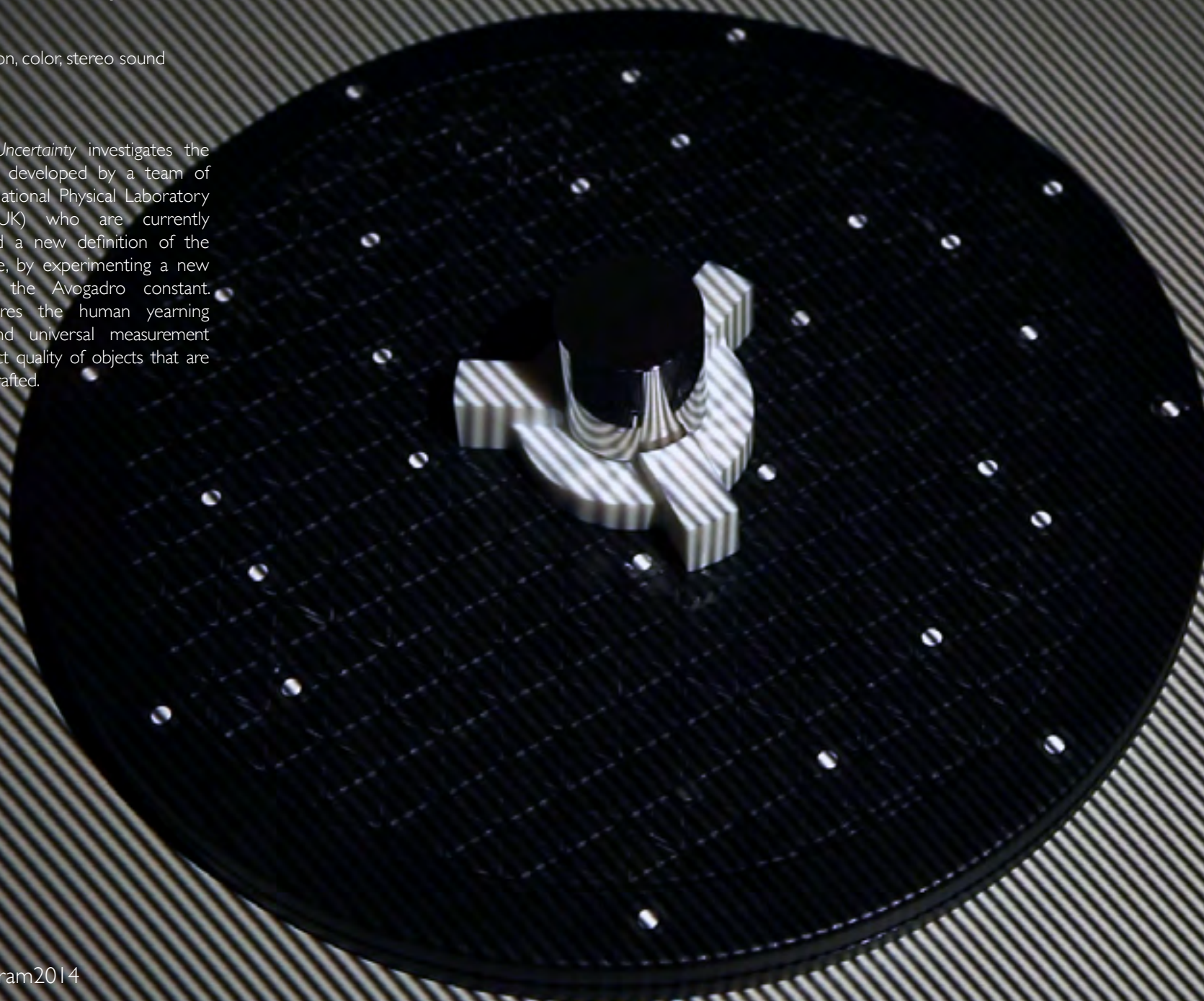
With a Relative Uncertainty is a project that between 2014 and 2017 has been following such process of redefinition. Establishing a network of collaborations with both national scientific institutions and contemporary art centers, the project has lead to the creation of a broad body of works, encompassing film, installation, texts and performance.

With a Relative Uncertainty, 2014

still from video

HD video, projection, color, stereo sound
7'45''

With a Relative Uncertainty investigates the research currently developed by a team of scientists at the National Physical Laboratory in Teddington (UK) who are currently attempting to find a new definition of the kilogram prototype, by experimenting a new interpretation of the Avogadro constant. The work explores the human yearning for exactitude and universal measurement through the abstract quality of objects that are nevertheless handcrafted.



[Link to video](#)

Password: kilogram2014

With a Relative Uncertainty, 2014

installation view at Villa Romana (FI)



[Link to video](#)

Password: kilogram2014

NPLone, 2014

installation view at Galleria Civica di Trento (IT)

HD video on LCD screen, color, stereo sound
4'06" looped

Shot at the National Physical Laboratory in London, the film portrays the process of calibration of the kilogram prototype with the so called "Avogadro sphere". What is acknowledged as the roundest object ever created, is the key element that will enable a new mathematical definition of the kilogram. Thus, the work examines such paradox: a new, non-objectual definition of the kilogram can happen only through a purposely built human artefact.

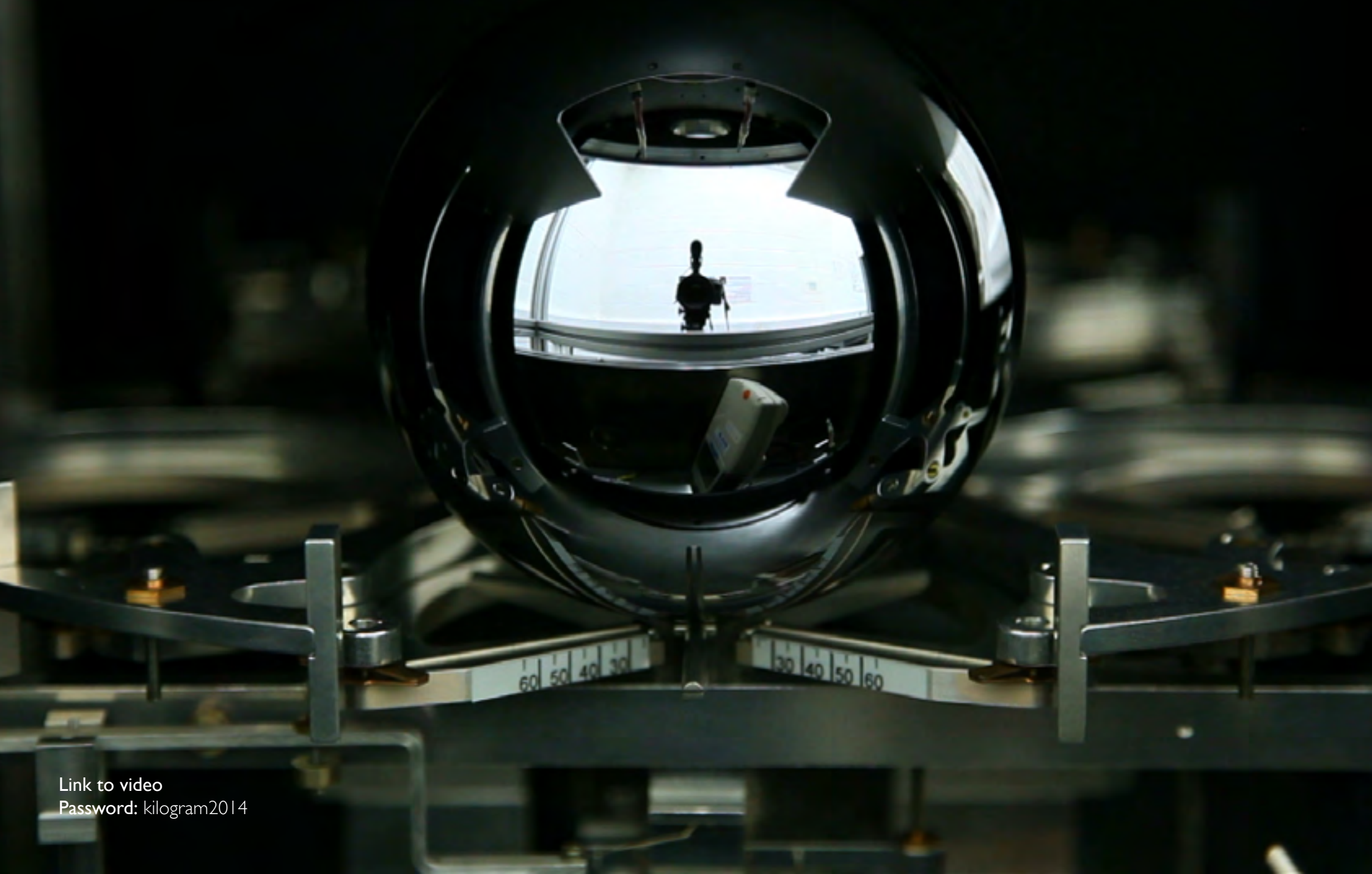


[Link to video](#)

Password: kilogram2014

NPLone, 2014

still from video



[Link to video](#)

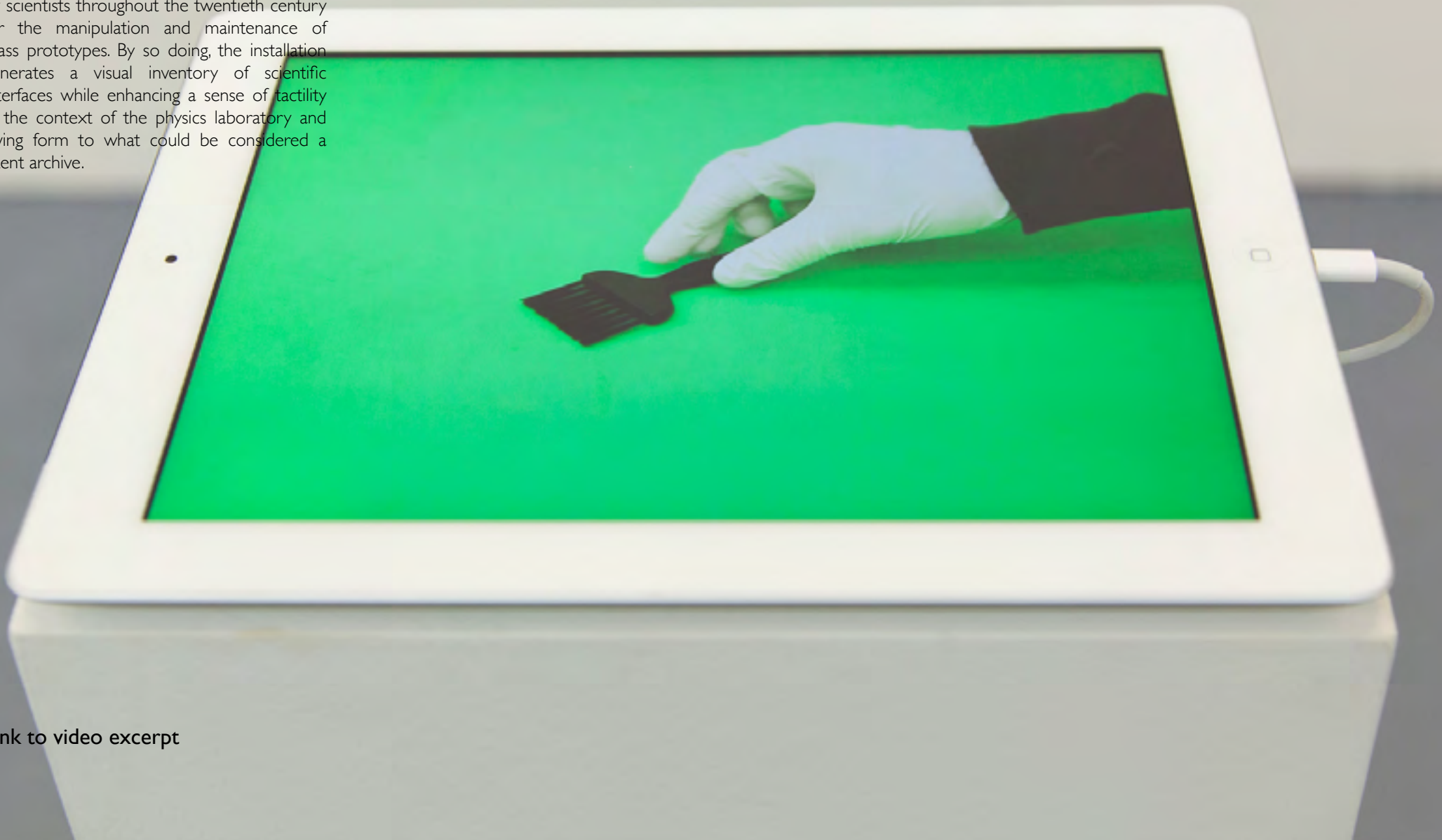
Password: kilogram2014

Untitled (interfaces), 2014

installation view at Camberwell Space (UK)

HD video on Apple iPad, color, silent
8'12" looped

On a greenscreen background is displayed the vast array of objects, tools and devices created by scientists throughout the twentieth century for the manipulation and maintenance of mass prototypes. By so doing, the installation generates a visual inventory of scientific interfaces while enhancing a sense of tactility in the context of the physics laboratory and giving form to what could be considered a latent archive.



[Link to video excerpt](#)

Untitled (interfaces), 2014
still from video



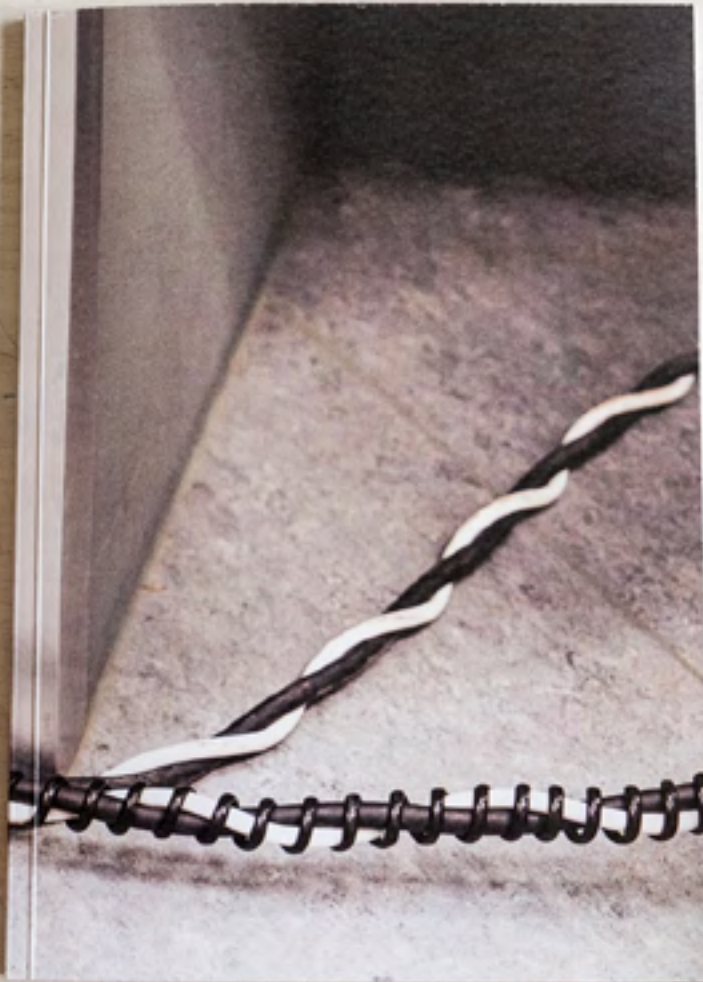
[Link to video excerpt](#)

Under Specified Conditions, 2015

artist book

52 color pages on 130 gsm Scandia paper
edition of 45 numbered and signed

Under Specified Conditions is a project comprising a lecture-performance and a publication. The publication takes the form of an artist book where the conventional text-image hierarchy of scientific papers is playfully subverted, exploring issues of representation through the results of a series of failed attempt to 3D scan the kilogram prototype.

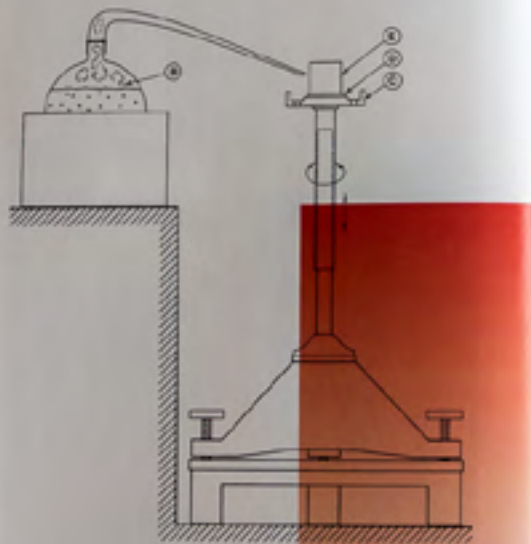


Under Specified Conditions, 2015

artist book

52 color pages on 130 gsm Scandia paper

edition of 45 numbered and signed



Under Specified Conditions, 2015

performance view at Hotel Pro Forma (DK)

lecture-performance
35'00"

Under Specified Conditions is a project comprising a lecture-performance and a publication. Combining visual and textual materials from both artistic and scientific sources, the lecture revolves around a fictional narrative produced through a series of artist-led experiments involving the kilogram prototype. While speculating on the seemingly resistance of the kilogram to digital technologies, the lecture addresses questions of knowledge production in cross-disciplinary contexts.



[Link to performance excerpt](#)

Under Specified Conditions, 2015

performance view at Centrale Fies (IT)

lecture-performance

35'00"



[Link to performance excerpt](#)

Photo: Andrea Pizzalis / Centrale Fies

***Pointcloud I*, 2016**

installation view at Galleria Giorgio Galotti, Torino (IT)

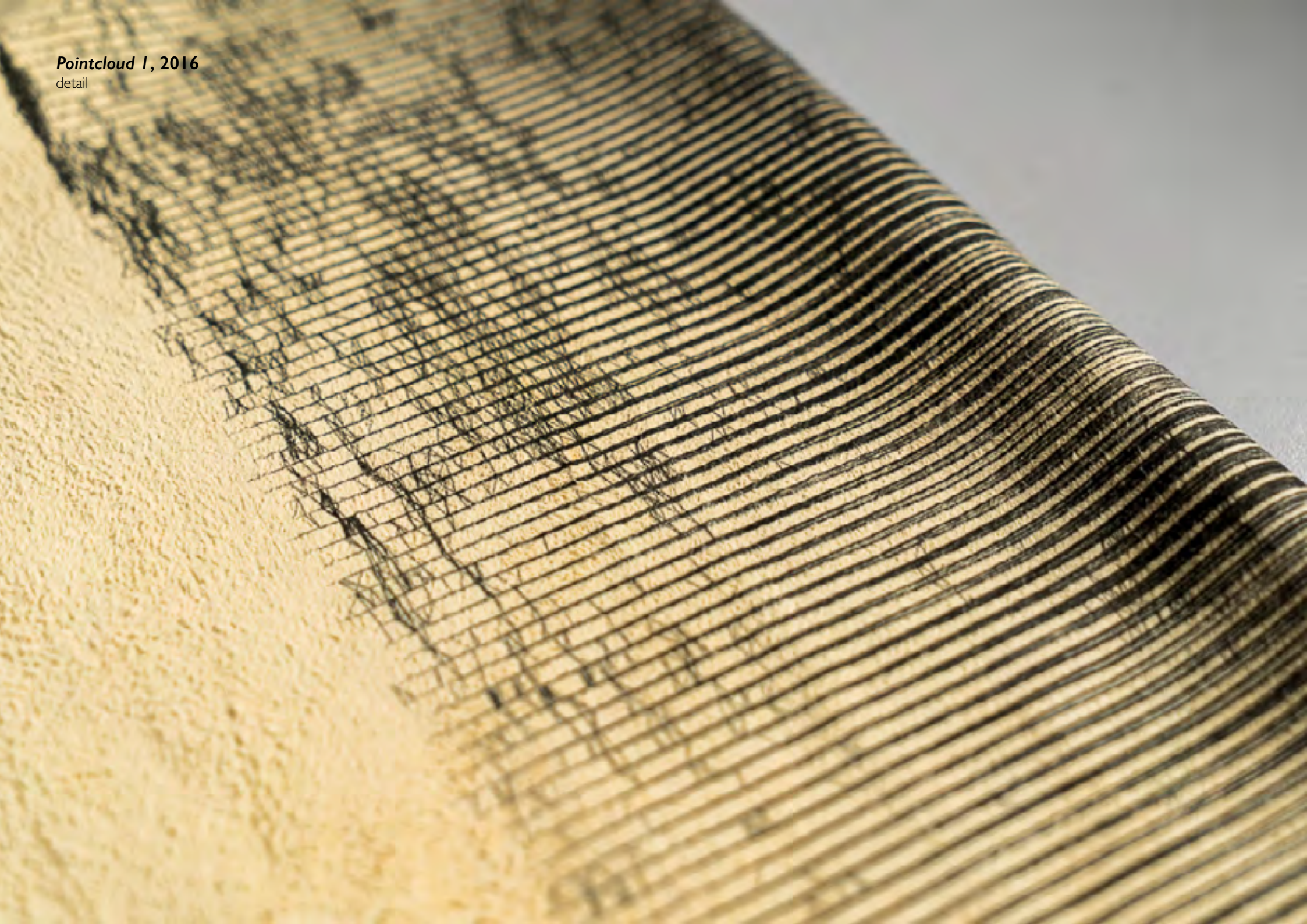
UV printed 3D model on leather,
acrylic, mdf, polycarbonate
75 x 45 x 8 cm

Pointcloud I is the first of a series of prints on chamois leather, the same one used for the cleaning procedures of mass prototypes. Recalling artisanal processes and organic matter, such leather is subjected to a process UV printing, depositing the digital *dirt* produced during the failed attempts to 3D scan the kilogram prototype.



Pointcloud I, 2016

detail



Pointcloud II, 2016

UV printed 3D model on leather,
acrylic, mdf, polycarbonate
55 x 30 x 8 cm

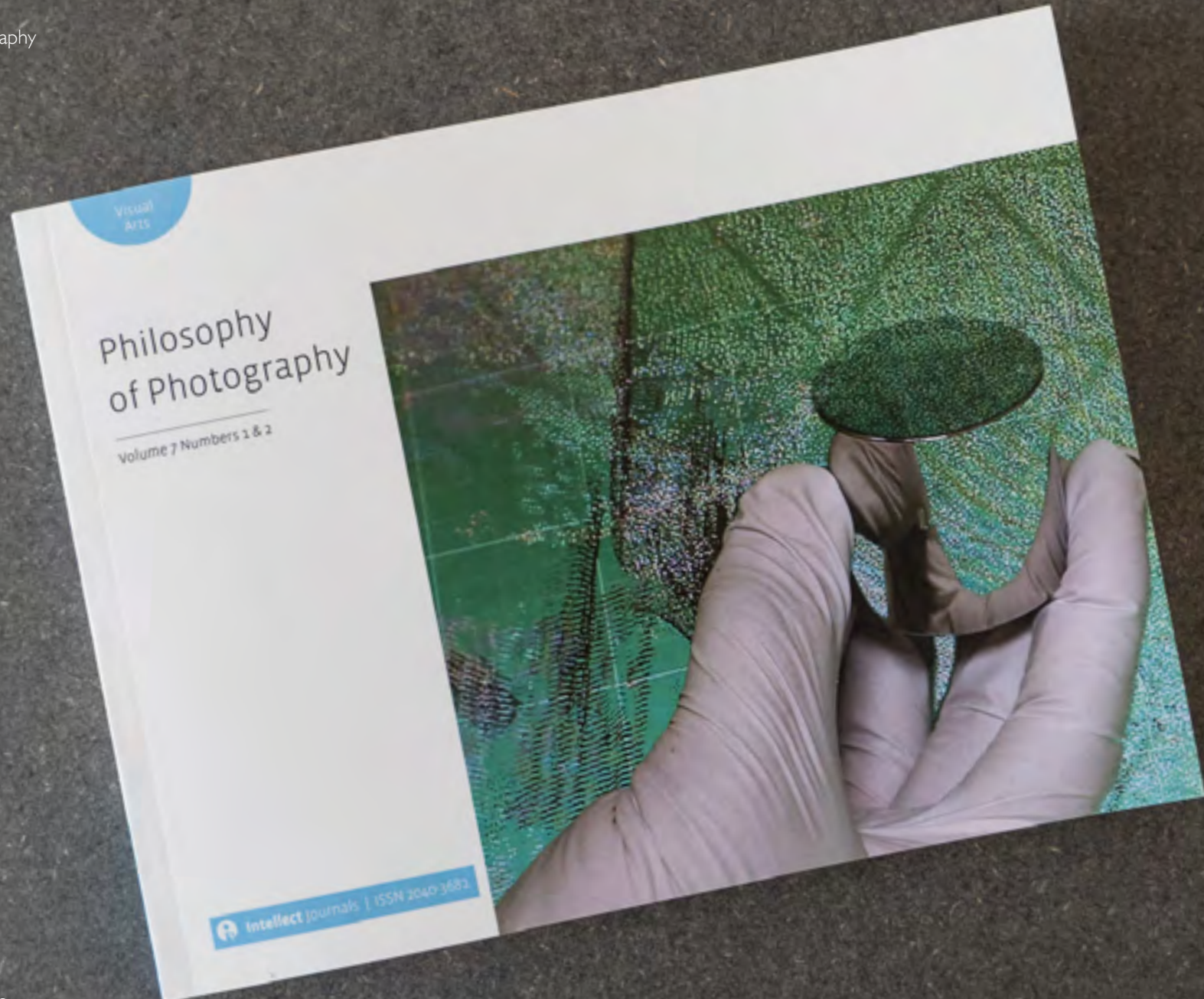


Pointcloud II, 2016
detail



Non-standard Uncertainties, 2016

paper for Philosophy of Photography
Intellect Journals, London (UK)



[Link to online journal issue](#)

Philosophy of Photography
Volume 7 Numbers 1 & 2

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GIACOMO RAFFAELLI
Sciences Po

Non-standard uncertainties: Experiments in the visual conditions of the kilogram prototype

Keywords

kilogram
prototype
metrology
standard
measure
3D

Abstract

The kilogram prototype is an object manufactured in late nineteenth century to serve as the standard unit of mass worldwide. Since then, the kilogram definition has been determined by this unique object, making it a peculiar case in metrological studies. However, after realizing that the prototype's mass was unexpectedly changing, scientists are seeking a new way to define the kilogram in pure mathematical terms.

Over the last two years, Raffaelli has produced a body of work exploring such processes of redefinition in collaboration with scientific centres in London and Copenhagen. In conjunction with film and photography, three-dimensional (3D) scanning has become for the artist a means to displace the artefacts from the bunker-laboratories where they are stored. However, what can be considered the most perfect of analogue objects seems to physically resist digital representation.

Pauline (teaser for an unmade film), 2017

4K video, stereo sound
53"

Pauline is a film about the unique relationship of a French scientist with the International Kilogram Prototype. Having a new definition of the prototype being announced for 2018, *Pauline* is the ultimate repository not just of the protocol of preservation of the last remaining physical unit of measurement, but also of a certain way of doing science and producing knowledge. To engage with such issues, as well as with the role of *Pauline* as a woman in a leading position in the male-centered arena of scientific institutions, the film will be based on the speculative creation of an *avatar* of Pauline Barat, rewriting her personal history through the theories of feminists thinkers in the history of science.



Being Singular Plural, 2018

essay commissioned for The New Work Times catalogue for "The Artist is Present" by Maurizio Cattelan

Being Singular Plural is a text commissioned for The New Work Times, a publication exploring the role of copies in contemporary visual culture. The text examines the simultaneously unique and multiple condition of existence of the kilogram prototype(s).

The text is published in both English and Chinese languages. The title is a direct reference to Jean-Luc Nancy's text of the same name.



Credits

a project by
Giacomo Raffaelli

co-produced by
Atelier Hotel Pro Forma
Centrale Fies

in collaboration with
DFM - Danmarks Nationale Metrologiinstitut
NPL - National Physical Laboratory

and
DTU - Technical University of Denmark
IT University Copenhagen

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nctm e l'arte: artists-in-residence
Institut Français / Cité internationale des arts, Paris

and

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