WITH A RELATIVE UNCERTAINTY

10000

a project by Giacomo Raffaelli

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

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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

Link to video Password: kilogram2014

NPLone, 2014

installation view at Galleria Civica di Trento (IT)

HD video on LCD screen, color, s 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

Link to video Password: kilogram2014 60 50 40 30

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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

Samerana and a substant

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 textimage 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.

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Link to performance excerpt

Under Specified Conditions, 2015 performance view at Centrale Fies (IT)

lecture-performance 35'00''

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Link to performance excerpt

Pointcloud 1, 2016

installation view at Galleria Giorgio Galotti, Torino (IT)

UV printed 3D model on leather, acrylic, mdf, policarbonate $75 \times 45 \times 8$ cm

Pointcloud 1 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 1, 2016 detail

Pointcloud 11, 2016

UV printed 3D model on leather, acrylic, mdf, policarbonate 55 × 30 × 8 cm



Pointcloud II, 2016 detail

Non-standard Uncertainties, 2016

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



Link to online journal issue

Non-standard Uncertainties, 2016

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

PGP 7 (3+3) p0. 33-43 lotetect Limited 2016

© 2016 Intellect Ltd Article: English language. doi: 10.1386/p00.73-2.23_1 Philosophy of Photography

GIACOMO RAFFAELLI Sciences Po

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

The kilogram pretotype is an object manufactured in late matchevels century to serve as the standard unit of The tringener preserve is an erger manufactures in an enseteenes centary to acree as the internated unit of mass worldwide. Since then, the kilogram definition has been determined by this unique object, making is a simultar condition subvolved analysis. However, using multiples that the modelshow's more set and and and and a New continents, since there, we congress approache aux ever decomment by this unique reject, searcing is a southar core in retrological studies. Heaveer, after realizing that the prototype's mass suits an expectedly domains, scientific aux tooking a new may be define the billowing in more well-sensitive larger. becaltar case on metrologismi studies. However, after realizing that the prototype's mass aver duanging, sciencists are seeking a new way to define the kilogram in pure mathematical terms. Over the last two years, Raifeelii has produced a body of work esploring such processes of redefini-from an cullaboration with monthlin control in London and Consolution. In conjunction with the Over the last two years, Kattaeta has promoted a budy of work exporting such processes of redefini-tion in collaboration with scientific centres in London and Copenhagen. In conjunction with film 600 mt collaboration with scientific centres in Condon and Copenhagen. In conjunction with him and photography, three dimensional (3D) scarving has become for the artist a means to displace the resolution from the burder laboratories where they are stored. However, what can be resolution. and photography, introl dimensional (90) scanwing has become for the artist a means to displace the ansetads from the burker-laboratories where they are stored. However, what can be considered the most unified of englement blocks assess to about allo resist disingly encountation. the antefacts from the burdeer-fagorationes where may are stored. However, what can the most perfect of analogue objects seems to physically resist digital representation.

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Keywords

kilogram prototype metrology standard measure 3D

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Link to online journal issue

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 remaing 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 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 exhistence 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.



THE NEW WORK TIMES MAURIZIO EDITION

Mysterious death

empire basically turned a blind eye to the gay activity, as Hadrian was so good at being an absolute boss.

Mysterious death In the year 130 AD, yes about 1900 years ago, Hadrian and Antinous were sailing on the river Nile. Antinous fell into the water and drowned. There are several

water and drowned. There are several theories as to how this happend. He may have thrown himself into the water to end the relationship that could have valued his beloved Hadrina's reput-tion. The longer the affair lasted, the greater the risk of being membered as a homoscour latther than a great En-peror I could have been that Antinous was drowned our purpose to try and pre-long Hadrina's life. It was believed that

Hadrian

antinous:

an ancient

love story

BY PLANET ROMEO

and

ESSA

BY GIACOMO RAFFAFLLI

This is a text about an object. It This is a text about an object. It will explore the conditions that un-dermine its existence and how its physical and visual peculiarities are something more than just an aes-thetic factor. To talk about this object, it is essential to start from a defini-tion, which is itself one of the forms tion, which is itself one of the forms of its existence: 'The unit of mass is the kilogram; it is equal to the mass of the international prototype of the kilogram' (BIPM 2006: 112). This is the official definition of what

This is the official definition of what is acknowledged as the universal unit of mass, according to the Bureau international des poids et mesures (BIPA), the Paris-based institution that since 1875 defines and controls the standard units of mesurement world-wide through the International System of Units (St). The SI is com-posed of seven fundamental units of measurement Mohin ent: Kelvin

measurement: Kelvin, Second, Metre, Kilogram, Candela, Mole and Ampere. These are used to measure temperature, time, length, mass, luminous intensity, amount of substance and electric current, repectively. As can be seen they are

KELCERATHER (and) Giacomo Raffaalli, Untitled, 2014, Courters of the artist

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1.2.1 Change in volume and mass of the 40 national prototypes of the kilogram wi respect to the mass and volume of the onal prototype, 1890. Courtesy national Bureau of Weights and

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Bust of Antinous, 130-150 AC ca., National Archeological Museum of Aquileia, Cultural Heritare and Landscare of the Italian Government

there was no real emotion involved, the rest of Roman society could tolerate many of the stat 80 survive today many of them in the Vatican museums

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独一复多的存在



Credits

a project by **Giacomo Raffaelli**

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

and DTU - Technical University of Denmark IT University Copenhagen

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and



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