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Supplementary Information for

Shedding light on 19th century spectra by analyzing Lippmann photography

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This PDF file includes:

Supplementary text
Fig. S1 (not allowed for Brief Reports)
Legends for Movies S1 to S2

Other supplementary materials for this manuscript include the following:

Movies S1 to S2

Supporting Information Text

1. Making Lippmann plates

Below is the procedure we followed to make our own Lippmann plates.

A. Holographic plates.

- Get Ultimate Holography U08C Lippmann (0 color preshift).
- Harden plates by putting them in oven at 50° C for at least 2 hours no more than 2 weeks before using them.

B. Developing and fixing solutions.

- Developer: solution of pyrogallol in ethanol at 10 g/l.
- Restrainer: solution of potassium bromide in demineralized water at 100 g/l.
- Accelerator: solution of ammonia in demineralized water at 25%.
- Fixer: solution of sodium thiosulfate in demineralized water at 100 g/l (dissolution is slow).

C. Plate exposure.

- Emulsion side must be behind (hint: fog will form only on glass side when blowing on plate).
- Sensitivity is ~ 1 mISO.

D. Development.

- Mix the developing solution in a tray (recipe for a $4'' \times 5''$ plate, otherwise scale appropriately):
  - 50 ml of water.
  - 5 ml of developer.
  - 5 ml of restrainer (may be added only during the process for more control).
  - 2 drops of accelerator (add just before development).
- Get in a dark room with very faint light (reasonably stronger light might be used shortly to check the development state by transparency).
- Immerse the plate in the developing solution (emulsion upside) for ~ 2 min (time depending on exposure and temperature, determined by experience so as to have bright rendition and limited saturation) while gently shaking.
- Immediately rinse the plate under running water for ~ 1 min.
- Do not reuse the bath.

E. Fixing.

- Immerse the plate for ~ 20 sec in the fixing solution within a few days of normal indoor light exposure after development (the bath can be reused for many plates).
- Immediately rinse the plate under running water for ~ 20 min.
- Note that fixing also shrinks emulsion.

F. Correcting a plate for blue shift (optional, by expanding emulsion).

- Put the plate in a solution of sorbitol in demineralized water at ~ 100 g/l.
- Increase or decrease the concentration of sorbitol of the bath until obtaining acceptable colors.
- Dry the plate as uniformly as possible (avoid heterogeneous concentration).

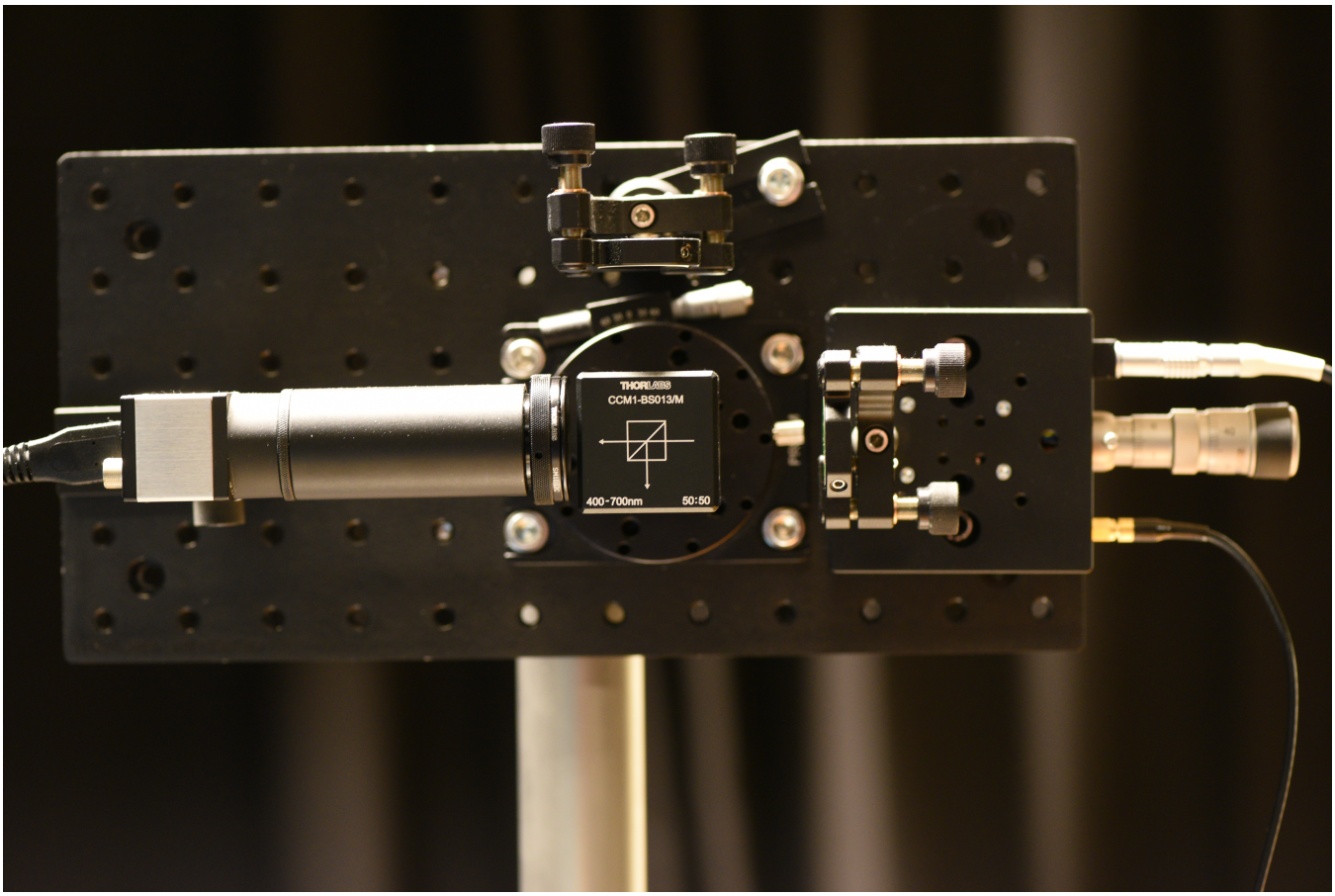

Fig. S1. Example of a digital Lippmann camera.

Movie S1. Example of a Lippmann plate under a moving light source.

Movie S2. Three-dimensional reconstruction of a plate from ptychographic X-ray tomography at cryogenic temperature.