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## **Two-dimensional optics : diffraction and dispersion of surface plasmons**

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# Propositions

to be defended along with the dissertation

## TWO-DIMENSIONAL OPTICS

### I

The topological charge of an optical field distribution in a transverse plane is distinct from the expectation value of the orbital angular momentum per photon, except in axial symmetry.

*This thesis, chapter 3*

### II

Two nanoslits on a gold film could be used as a wavefront sensor with much higher spatial resolution than the commonly-used Shack-Hartmann sensor.

*This thesis, chapter 4*

### III

The damping of a driven oscillator, and the conductivity of the metal in surface plasmon resonance, cause similar displacements of their maximum response.

*This thesis, chapter 5*

### IV

It is a misconception that the Otto configuration for studying surface plasmon resonances only causes difficulties.

*This thesis, chapter 5*

### V

The temporal cloaking device will need to be paired with extremely slow light if it is to hide an event from human eyes.

*Fridman et al. (2012). Nature 481, 62.*

### VI

Walking droplets are a good illustration of pilot wave theory at a macroscopic scale.

*Couder et al. (2005). Nature 437, 208.*

### VII

There is an advantage to cheap CCD cameras' lack of an infrared filter: one can use a laptop or mobile phone to check if one's TV remote is still working.

## VIII

There is a correlation between an object's color and the degree of polarization of the light it scatters.

*Horváth et al. (2010). An unexpected advantage of whiteness in horses: the most horsefly-proof horse has a depolarizing white coat. Proc. R. Soc. B 277, 1643.*

## IX

The data cloud could have been developed forty years ago, had it not been for the baby boomers' distrust of centralization.

*Foremski (2005, June 10). Exclusive interview with seminal 1960s computer visionary Doug Engelbart. Silicon Valley Watcher.*

## X

One can use a laser pointer to probe a cat's mechanical excitation states and their eigenfrequencies.

*Amiss & Abbott (1995). Method of exercising a cat. United States Patent No. 5443036.*

## XI

Scientists who don't trust students' possibly clumsy hands on their research should work at a research institute instead of at a university.

*Philip F. Chimento  
March 7, 2013*