# Novel Experiments for the Investigation of Non-Ideal Compressible Fluid Dynamics
## The ORCHID and First Results of Optical Measurements

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# Propositions

accompanying the dissertation

## NOVEL EXPERIMENTS FOR THE INVESTIGATION OF NON-IDEAL COMPRESSIBLE FLUID DYNAMICS
### THE ORCHID AND FIRST RESULTS OF OPTICAL MEASUREMENTS

by

**Adam Joseph HEAD**

1. The development of a general validation methodology for use in assessing the credibility of software always involves heuristics and the opinions of the experimenters.
   – *This proposition pertains to this dissertation.*
2. Flow field experiments are a means to evaluate the suitability of thermodynamic models to close the conservation equations.
   – *This proposition pertains to this dissertation.*
3. The problem of scientific articles pollution could be rectified by eliminating all the articles involving simulations which were not validated against a well-characterized experiment.
4. One should think carefully before speaking and acting but without waiting too long, for the *well-informed* boastful ones know when to act.
5. Happiness can neither be created nor destroyed but it could be better redistributed by means of knowledge, luck and dollar bills.
6. The mentality associated with the dogma of not publishing failed research attempts dooms future generations of scientists into making recurring mistakes.
7. Commercially funded PhD research significantly limit the originality of academic work.
8. Chromatic confocal imaging is a viable technique for the accurate measurement of the refractive index of organic vapors and thus can be used to derive point-wise density values in high speed vapor flows [1, 2].

These propositions are regarded as opposable and defendable, and have been approved as such by the promotor prof. dr. P. Colonna.

[1] BESSERER, G. J. & ROBINSON, D. B. 1973 Refractive indexes of ethane, carbon dioxide, and isobutane. *J. Chem. Eng. Data* **18** (2), 137–140.

[2] PAXTON, D. 2016 Experimental characterization of condensation behavior for metastable carbon dioxide. Master's thesis, MIT.