

Dr. Paolo Petagna
CERN

Dear Dr. Petagna :

First, I wish to thank you for admitting me to the special meeting in CERN on liquid helium. I have been thinking about this meeting since I left Geneva and I now wish to share with you my thoughts, to be followed by a modest proposal.

To begin, I think that there have been no new ideas on turbulence. I have what I think is a new idea, but it is only now that people are paying attention. I have published several papers and predictions which make the claim that the origin of turbulence is molecular, and therefore quantum mechanical. Once it gets started, it may be possible to describe it by modified Navier-Stokes equations, as people do.

To quickly get an idea of my point of view, I have attached 3 papers. The first has just come out in Physics Letters, where I believe that the major contribution is a theoretical re-definition of turbulence. A system is turbulent when the kinetic equation, or transport equation, admits of a solution where the velocity field could be multi-valued. Heretofore, there has not been a unique, universally accepted definition of turbulence. Of course, experimentally, we know and see when a system is turbulent, we simply cannot agree on the theoretical definition of turbulence. The other two papers have been published in a special journal for vacuum science and technology, where both the methods and the point of view are unfamiliar to turbulence researchers. Traditional turbulence researchers do not use vacuum equipment.

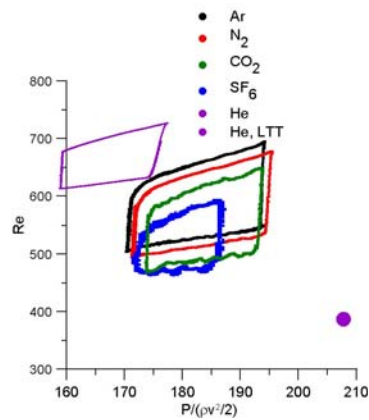
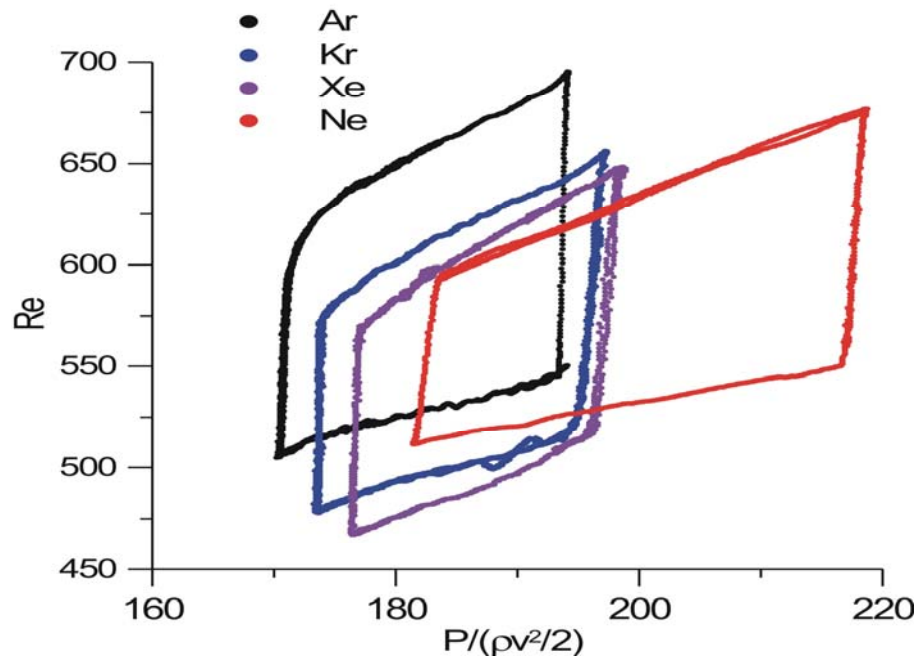
A good part of the latter two experiments were performed in CERN, under the auspices of Professor Antonino Zichichi. While the results, in my view, were significant, we could no longer continue the experiments because "turbulence is not a purvue of CERN." And I was congratulated and asked to find another sponsor, about which MKS, the vacuum technology manufacturer was interested. The results of the experiments were predicted by my atomic or molecular theory of turbulence, and in particular, the results for helium were most intriguing. As you very well know, all considerations of liquid helium should be quantum mechanical, although some people are convinced that a continuum, classical point of view is sufficient. I do not think so.

I have attached hysteresis curves for the onset of turbulence in this letter.

The first plot shows the hysteresis plots for the onset of turbulence for noble gases except helium. The helium plot will be off the scale. The second plot, re-scaled, shows helium in two separate experiments. The purity of the helium gas is not assured in relation to the isotopic contributions of He 3 and He 4. In reality, helium points are all over the place, in some uncontrolled way. The other noble gases have always yielded stable, reproducible plots. There is something about the onset of turbulence in helium gas. Just as I started asking for more helium gas, our experiments were terminated. In fact, with helium, I was forced to buy it from a supplier outside the CERN premises, which I did.

I believe your efforts in identifying helium-inspired projects, but in my opinion, before one can scale the helium presence, one must first understand the fundamental physics of helium behaviour. Mercifully, this could be done on desk-top equipment, as we have done at CERN.

By the way, according to scale invariance, all the hysteresis plots, regardless of specie, should lie on the same curve. Specie-dependence is a prediction of my molecular theory of turbulence. Many experimenters, even some who attended your conference, think these results are spurious. That was the reason for our friendly disagreement with Castaing, which you may have overheard. I have shown these results to John Ellis, who reacted with silence.



So here is my proposal now.

At no expense to CERN, I wish to re-assemble our apparatus, this time, in the cryogenic laboratory in CERN. The equipment may be re-assembled quickly, and all we need is some

helium 3 and helium 4, in small canisters, since the volume of our experimental vessel is only 200 cc. It is important to study the isotopic influence of results on the onset of turbulence. So we can bring back the apparatus, now at the University of Oldenburg. I will organize the experiments, I will need no salary, I will be self-funded by my retirement pension fund, all my health and accident insurance are all in order and valid in Europe. I will come in as an unsalaried visitor, as I did a few years ago. But I do have some funds for other visitors. While we are performing experiments with helium, which in my view will introduce new physics, we can talk about scaling the project to EU proportion, but not before. I can also assist you in some administrative and organizing work as we study scaled-up physics commensurate to the CERN personality. But we will start small, quietly and unobtrusively, for a while.

If you believe that it is possible to do this, I will be happy to start as soon you think it is possible. In the meantime, your secretary can research my scholarly pursuits with Google Scholar. I will be happy to make a visit and show you a detailed Powerpoint presentation.

Sincerely,

Amador Muriel