

10th IYNT 2022; Tskneti, Georgia

Problem 17. *Principle of least effort*

Reviewer: Darius Chitu

Team Romania - Limitless 3.0

21-28 August 2022

Proposed problem statement:

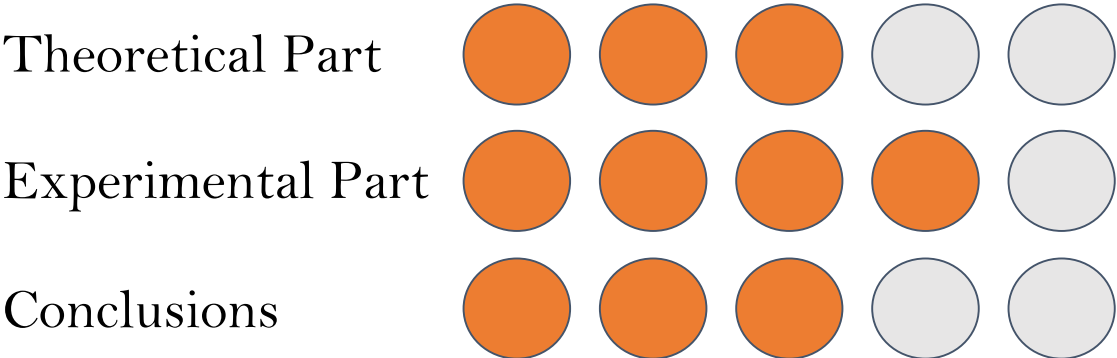
Like many other physical systems, **soap bubbles** and **soap films** **minimize energy, by minimizing their surface area** (minimal surface area). **Investigate this phenomenon** theoretically and experimentally.

Report

Strong points	Weak points
---------------	-------------

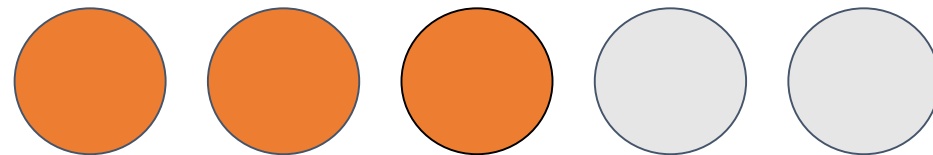
- 1. Explained the formation of a soap bubble
- 2. Great visual aids to help understand the structure and phenomenon
- 3. Good presentation of the Young-Laplace equation, correlating minimization of energy with minimization of surface area
- 4. Presented Hypothesis and sub- hypothesis

- 1. Little variation of the parameters
- 2. Calculations are hard to follow and not explained
- 3. Did not explain why in the experiment the soap film occupied the minimum surface
- 4. No data comparison between variations
- 5. Lack of experimental errors(especially between the simulations and the real life experiments
- 6. Was not able to answer satisfyingly the questions of the reviewer



Opposition

Strong points	Weak points
<ol style="list-style-type: none">1. Asked relevant questions about the reported problem.2. Took in consideration the lack of errors or theory.3. Had a thorough analysis of the reporter presentation4. Drew attention to non-euclidean geometry of soap bubbles	<ol style="list-style-type: none">1. Focused too much on what parameters the reporter did not vary and not actually on their research.2. Did not let the reporter finish the answers during the discussion.(too aggressive)3. Focused only on his opinion.4. Focused only on one discussion topic, whilst not taking into account the reporter's answers.



Discussion topics

1. Opp: Which forces are relevant? (Gravitational forces are relevant)
Rep: Gravitational forces are irrelevant in the theoretical model (We do not agree with the reporter)
2. Opp:When you have mentioned the simple geometry. Can we use the same numbers for the 2 triangles?
Rep: Yes(We agree with both, with the reporter on the simplified theoretical model)
3. Opp: Wouldn't the soap film change the position, if we change the position of the shape?
Rep: It would not change. (I agree with the Opp)