HOW TO DISTINGUISH A GOOD POSTER DESIGN FROM A BAD ONE....
THE GOOD

* Clear, concise, informative
* Strong use of visuals and headers for key points
* Context - summary, key points of interest, future possibilities
THE BAD

* No clear structure or context

* Small graphics and text, lack of design consistency

* Exclusion of key information, e.g. acknowledgements & references
AND THE UGLY

* Text Overload
* No hierarchy of information
* A book rather than a poster
Femtosecond Laser Ablation of Thin Nickel Films

Introduction

The key advantage of femtosecond laser machining is the ability to deposit the laser pulse energy in a very short time, which causes ablation to occur before significant thermal diffusion gives rise to undesirable melt regions in the surrounding area. The high peak power of the laser pulse also makes it possible to machine difficult materials such as glass. After the laser energy is absorbed in a metal, the high heating rate gives rise to a thin layer of ionised metal vapour which consists of neutrals, electrons, ions and molten droplets. This layer (Knudsen layer) is then ejected at high speeds (~1x10^6 m/s) away from the surface (due to thermal stresses). The ablation plume is ejected along the normal to the surface of the metal. The directionality of the plume depends on the initial conditions of the plasma. Confinement of the heated volume was achieved using thin metal films (figure 1) deposited on a sapphire substrate (transparent to 775 nm radiation). The directionality of the ablation plume was then compared for a range of film thicknesses.

Experimental

A Clark CPA 2001 femtosecond laser system was used to produce 200fs pulses at a wavelength of 775 nm. A fluence of 1.3 J/cm^2 was used for all measurements. A Langmuir probe consisting of an exposed tip of a cylindrical metal wire was used to measure the ion current of the flowing plasma. A bias of -25V was applied to the probe tip to repel electrons. The probe was hence used in the ion saturation regime. Experiments were carried out in a vacuum pressure of 10^-4 Torr to avoid collisions between the expanding plasma and ambient gas molecules. The Ni films of varying thicknesses (25 nm, 10 nm, 5 nm) were placed on a rotating stage inside the vacuum chamber to allow for a fresh area of the sample to be machined for each measurement. Ion signals from the Langmuir probe were recorded as voltage on an oscilloscope. Time of flight (TOF) signals were integrated with respect to time to calculate the total ion yield for the angle. Angular measurements were achieved by rotating the probe around the axis of the sample (figure 3). The angular distribution measurements were then fitted to Anisimov’s model of gas expansion under vacuum conditions [1]. Kappa values were then extracted from the fit. (Kappa values are a measure of the forward peaking nature of the plume, a Kappa value of 1 would indicate a plume which is equally distributed in all ejected angles, higher Kappa values indicate a more forward peaking plume).

Results

Angular distribution measurements taken for three different film thicknesses (figures 4a, 4b, 4c). Kappa values were extracted from the fits to the data and indicated on the graphs. Higher Kappa values were recorded for thinner films showing increased thermal confinement that leads to a more forward peaking plasma plume. Some data points are missing due to the probe blocking the laser pulse. The data was shown to be in reasonable agreement with Anisimov’s model.

Summary and Conclusions

- Thin films of Ni deposited on a sapphire substrate were ablated using 200fs laser pulses
- The ablation plume incorporated a significant amount of ionised metal vapour
- The directionality of the plasma plume was recorded using a Langmuir probe
- The forward-peaking nature of the plume was quantified by fitting the data to Anisimov’s model of gas expansion
- Ablation of thinner films resulted in a more forward-peaking plasma plume
- Thermal confinement in the film and hence increased thermal stresses within the heated volume are believed to cause a more forward peaking plume

LAYOUT COMPARISON

DO THIS

[Image: Substance X induces Y cells]

Title makes a strong statement

NOT THIS

[Image: Effect of X on Y cells]

Source: http://www.ncsu.edu/project/posters/NewSite/CreatePosterGraphics.html
TIPS FOR SUCCESS

DO THIS

* **Emphasize using visuals** - graphic elements should dominate.

* **Use graphics, cartoons, and figures instead of text.** Remember, a picture is worth a thousand words.

* **Use color to emphasize** or to link words and images together.

* **Use bold lines and obvious pattern** or color to distinguish figures.

* **Use graph and table formats** that portray the data without reference to extensive keys.

* **Write explanations** directly on the figures.

* **Minimize abbreviations and cross references.**

NOT THIS

* **Visually de-emphasize** to obscure your message.

* **Portray the main points in the smallest type.**

* **Avoid color** - think grey or monochrome.

* **On graphs, use thin lines or bars** with patterns that are hard to distinguish.

* **Make all figures so small** that the important information is invisible from 2m away.

* **Use complicated legends** far that require the reader to constantly look back and forth between figure and legend.

* **Use lots of acronyms and shorthand** that the viewer has to memorize or constantly look up.
Southern Flounder Exhibit Temperature-Dependent Sex Determination

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Introduction
Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

Objective
This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

Methods
- Southern flounder broodstock were strip spawned to collect eggs and sperm for in vitro fertilization.
- Hatched larvae were reared from a natural diet (rotifers/Artemia) to high protein pellets and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juveniles flounder were stocked at equal densities into one of three temperatures: 18, 23, or 28°C for 245 days.
- Females were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

Histological Analysis

![Histological Analysis](image)

**Male Differentiation**  **Female Differentiation**

Temperature Affects Sex Determination

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>% Females</th>
<th><strong>P</strong></th>
<th><strong>P</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>30</td>
<td>0.01</td>
<td>0.001</td>
</tr>
<tr>
<td>23</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(***P < 0.01 and **P < 0.001 represent significant deviations from a 1:1 male:female sex ratio)

Growth Does Not Differ by Sex

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Body Weight (g)</th>
<th><strong>Male</strong></th>
<th><strong>Female</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (18°C)</td>
<td>20</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Mid-range (23°C)</td>
<td>23</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>High (28°C)</td>
<td>25</td>
<td>14</td>
<td>11</td>
</tr>
</tbody>
</table>

Results
- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperature produced 4% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

Conclusions
- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

Acknowledgements
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REVIEWER’S COMMENTS

POSITIVE POINTS

* The **title** conveys the main message instantly.

* **Context** and **objectives** are made **clear**.

* **Methods** are **concise**.

* **Graphs are interpreted by their titles.** One can read the titles and trust the authors, or examine the graphs in more detail.

* **Results and conclusions are concise** and relate back to objectives.

* **Color scheme** is very **simple** and pleasing.

* **Font is large** enough everywhere, including figures.

NEGATIVE POINTS

* **Results and conclusions do not relate back to context** (Introduction). It would be nice to see a statement of how the findings relate to aquaculture.

* Some viewers have noted that the **title could be more direct**: "Temperature Determines Sex of Southern Flounder"

* **Title font is on the small side** - could be larger.

* Some viewers have felt there is **too much white space** between the columns. It could be reduced somewhat, but not too much.