科研绘图经验分享

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2022年4月1日

C 目录
ontents

大连海事大学
DALIAN MARITIME UNIVERSITY

如何选择合适的字体

1.选用sans serif（无衬线）字体

- 首选：Arial，Helvetica，微软雅黑
- Adobe：Myriad
- Apple：San Francisco

2.字号要小

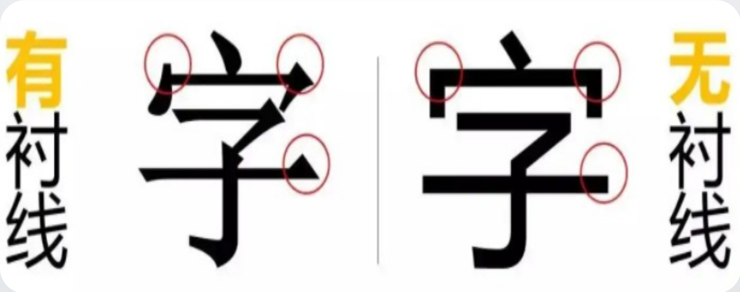
- 5pt — 7pt

3.尽量不添加颜色

4.尽量不加斜体

5.数量-单位/运算符之间加空格

- 10μW → 10 μW



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nature > for authors > final submission

For Authors
Editorial criteria and processes
Formatting guide
Presubmission enquiries
Initial submission
Final submission
Supplementary information
Forms and declarations
Matters Arising
Other types of submissions
Publishing options

Final submission

This guide provides information on preparing production-quality figures and text files. The instructions apply only if your manuscript has been accepted in principle for publication and an editor has asked you to upload production-quality material.

General information

Before your manuscript can be formally accepted for publication and passed to our subediting, art and production departments, you will need to upload electronic files of your text, figures, Extended Data figures and tables, and Supplementary Information (if any) to our server. You will also need to upload scanned copies of any forms and declarations requested by the editorial office for signing (these may be faxed if scanning is not possible, with the fax labelled clearly with the corresponding author name and manuscript reference number).

Please follow these guidelines to ensure that your final files are complete and in the correct format. This will speed the handling of your manuscript after it is accepted, reduce delays and minimize potential errors.

If you are unable to upload production-quality files to our server, you should contact *Nature*'s London office for details of how files may be sent on disk, although you should be aware that online submission is the preferred route and submission by other means may delay acceptance and/or publication of your paper.

Lettering

Lettering should be in a sans-serif typeface, preferably Helvetica or Arial, the same font throughout all figures in the paper. Units, capitalization, etc. should follow *Nature* style. Where practical, avoid placing lettering directly over images or shaded areas.

Separate panels in multi-part figures should each be labelled with 8 pt bold, upright (not italic) a, b, c. Maximum text size for all other text should be 7 pt; minimum text size should be 5 pt. Amino-acid sequences should be presented in one-letter code in Courier.

Do not rasterize or covert text to outlines.

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ACS Nano Author Checklist

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- ☐ Provide permission obtained to reproduce previously published (copyrighted) material.
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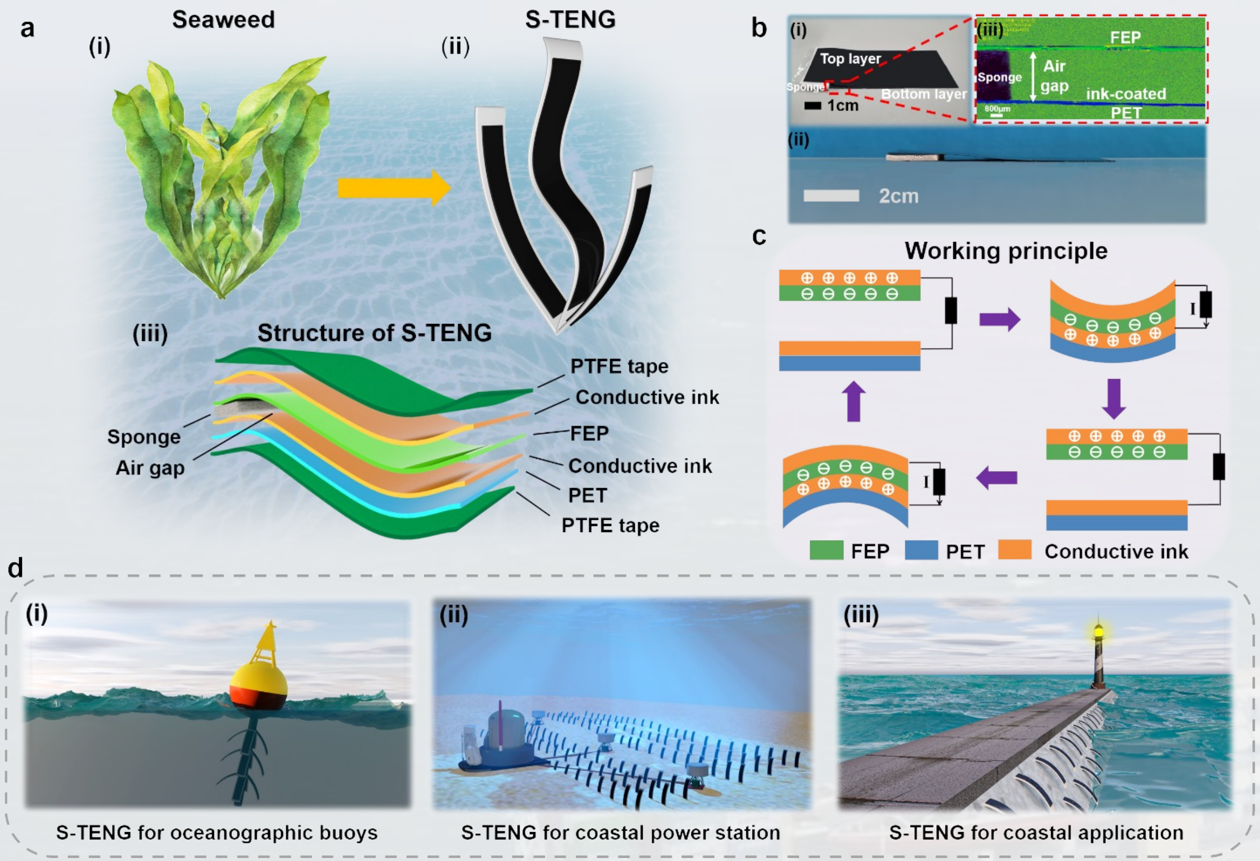
Table of contents graphic:

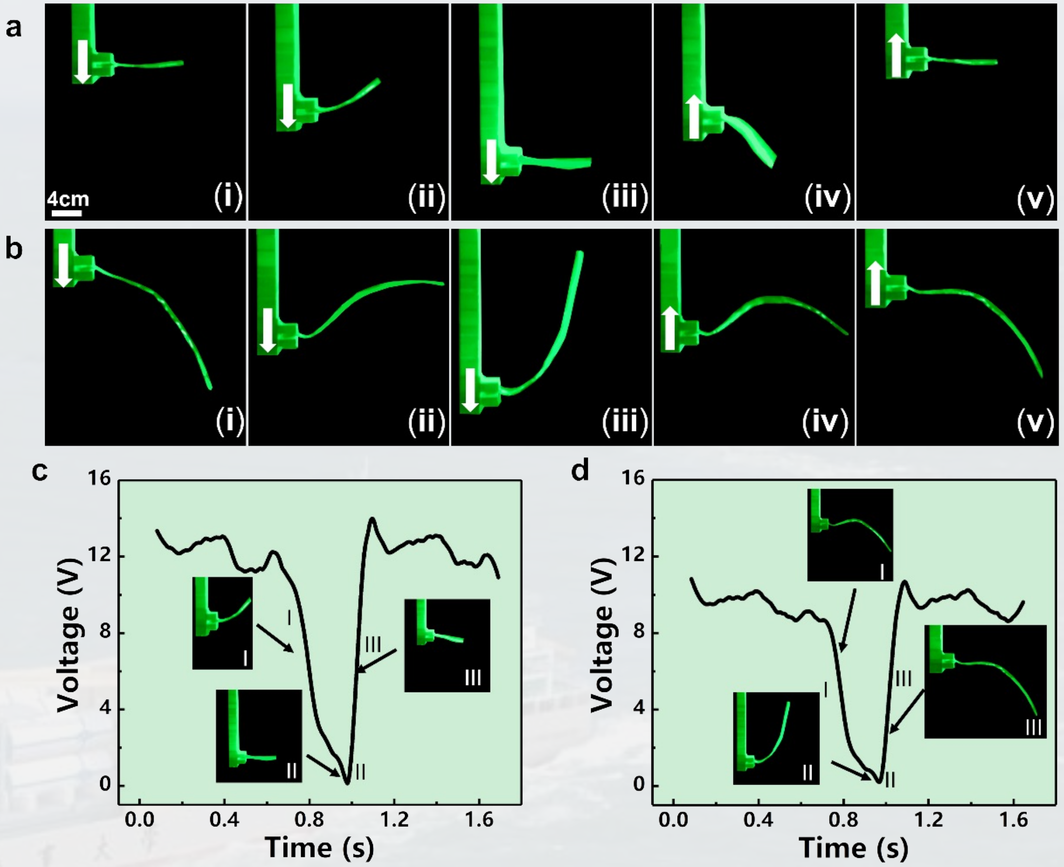
- ☐ All Table of Contents (TOC) images must be original, created by one of the authors, and cannot be reproduced, adapted, or modified from other sources. Images modified through manipulation including rearranging, cropping, masking, and distorting, should not be used. The use of licensed stock images in TOC graphics is not allowed.
- ☐ TOC graphic is required for the following manuscript types: Articles and Reviews, maximum width 9.0 cm and height 4.0 cm; Perspective and Nano Focus, maximum width 4.5 cm and height 4.0 cm. This graphic should be in TIF or EPS format and at least 300 dpi resolution at final printed size. The graphic should capture the readers' attention and provide a visual impression of the essence of the manuscript. Please keep the text portion of the image to a minimum. Consult the Guidelines for Table of Contents/Abstract Graphics for specifications.
- ☐ Under no circumstance can a logo be included in the TOC graphic.

Figures and tables:

- ☐ All figures and tables must be cited in order (e.g., Figure 1A).
- ☐ Figures must have captions.
- ☐ Schemes must have titles and may contain footnotes.
- ☐ Structures should be numbered with boldface Arabic numbers.
- ☐ Use Arial for lettering within a graphic. Lettering should be of uniform size and density, points and lines should be no thinner than 0.5 point at final published size.
- ☐ Figures containing photographic images must be at least 300 dpi TIF files in RGB forma should be at least 1200 dpi EPS files.
- ☐ Figures must be submitted at final published size.

如何选择合适的字体





1.字体：序号、文字标注始终保持一致（无衬线字体）

2.字号：序号、文字标注的字号保持一致，序号 > 标注

3.非必要情况，尽量不改变颜色、不使用斜体

论文示意图的绘制

1.模型建立/绘制

- Solidworks/CAD
- Cgmodel.com
- Cg99.com

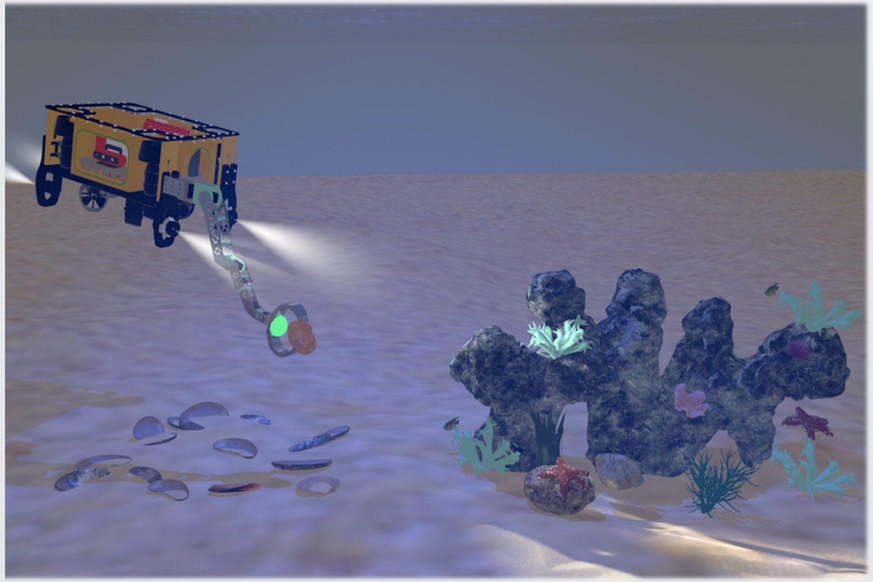
2.软件渲染上色

- Cinema 4D
- 3dmax/Maya
- Keyshot

3.成图后处理

- PS/AI/AE
- 导出Tif/Tiff格式

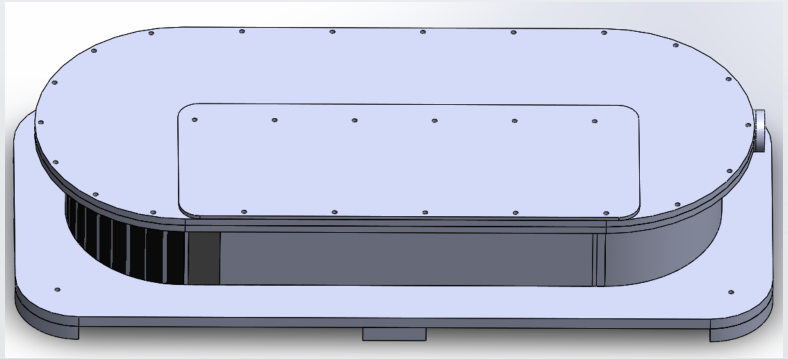
保持美观 浅显易懂



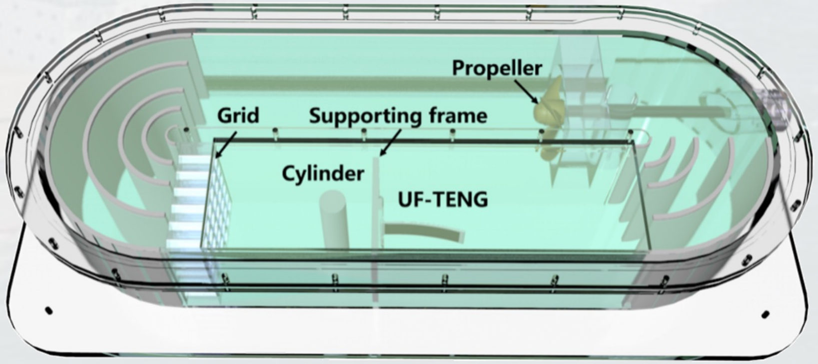
模型元素：ROV、贝壳、珊瑚、礁石

C4D中海底场景、灯光元素的建立

渲染、PS后处理（调亮度、饱和度）



模型元素：循环水槽



材质的选择、渲染、后处理

C4D工作窗口

1.渲染器

- 自带标准渲染器
- Octane渲染器

2.材质球的选择

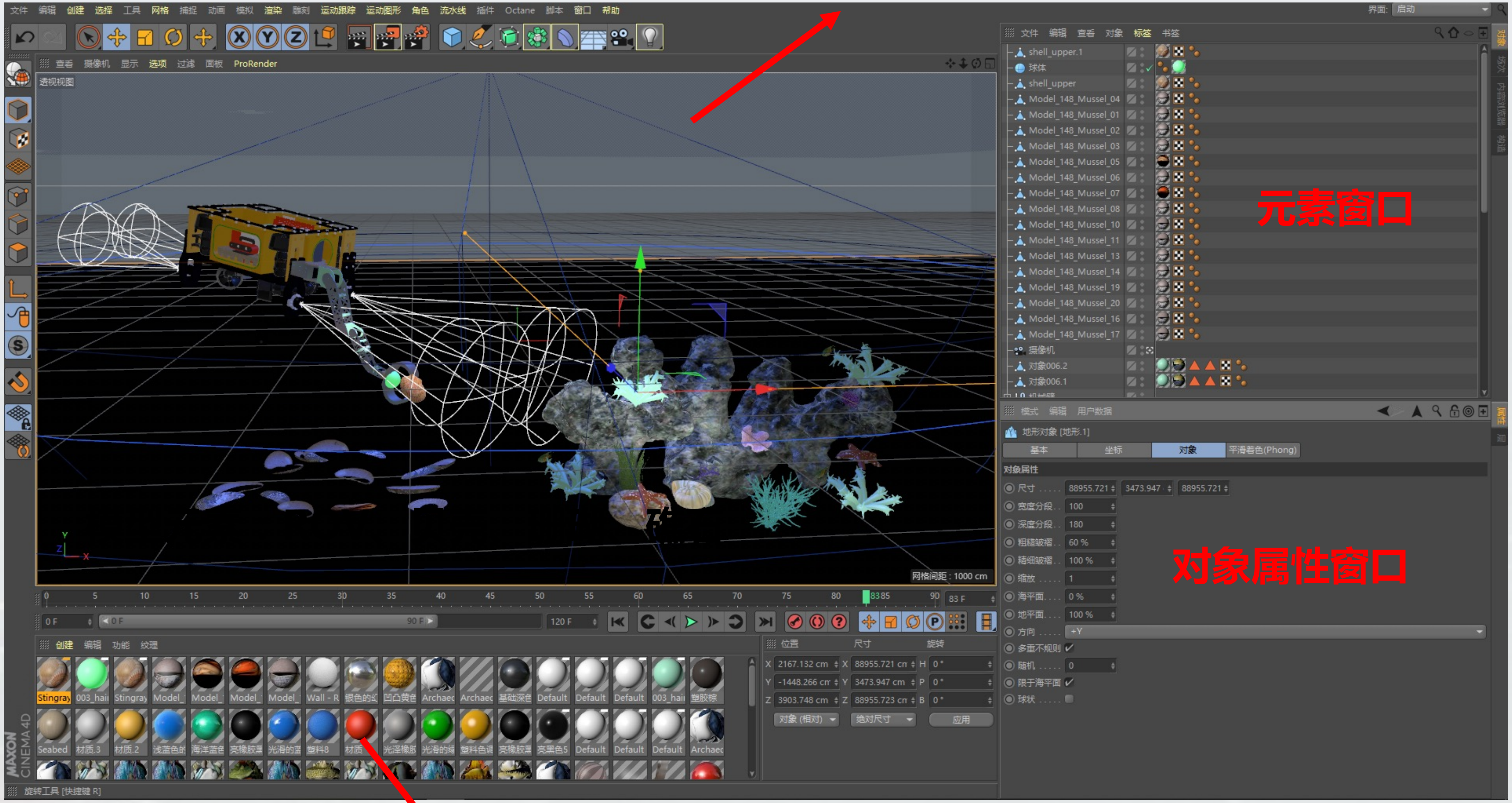
- 现有材质包
- 自调材质包

3.插件选择

- 海洋插件
- 粒子插件

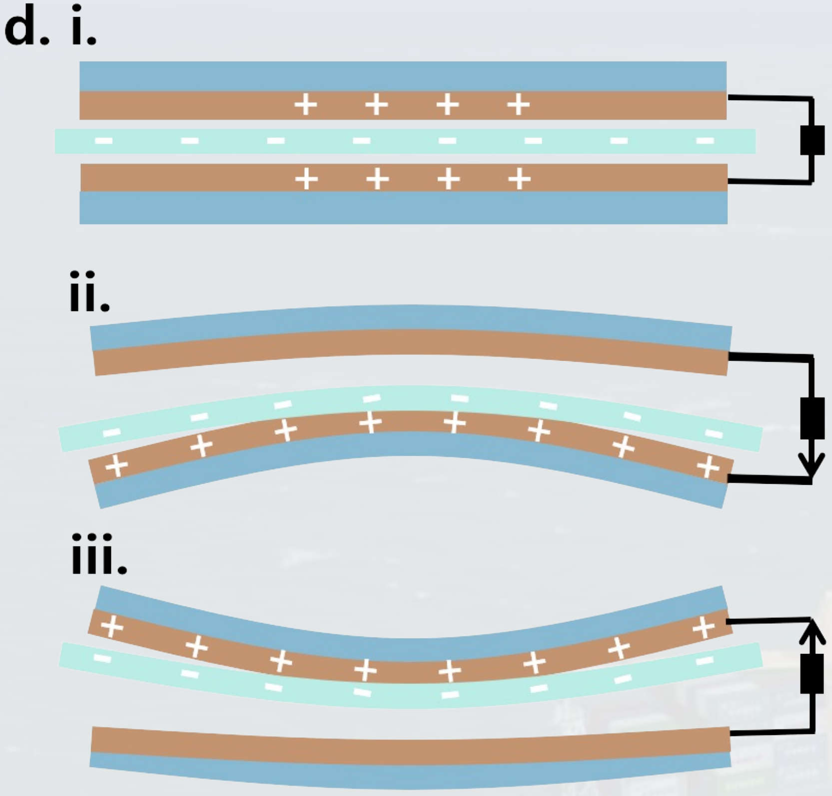
……

工作窗口/预渲染窗口



材质球窗口

PPT绘制

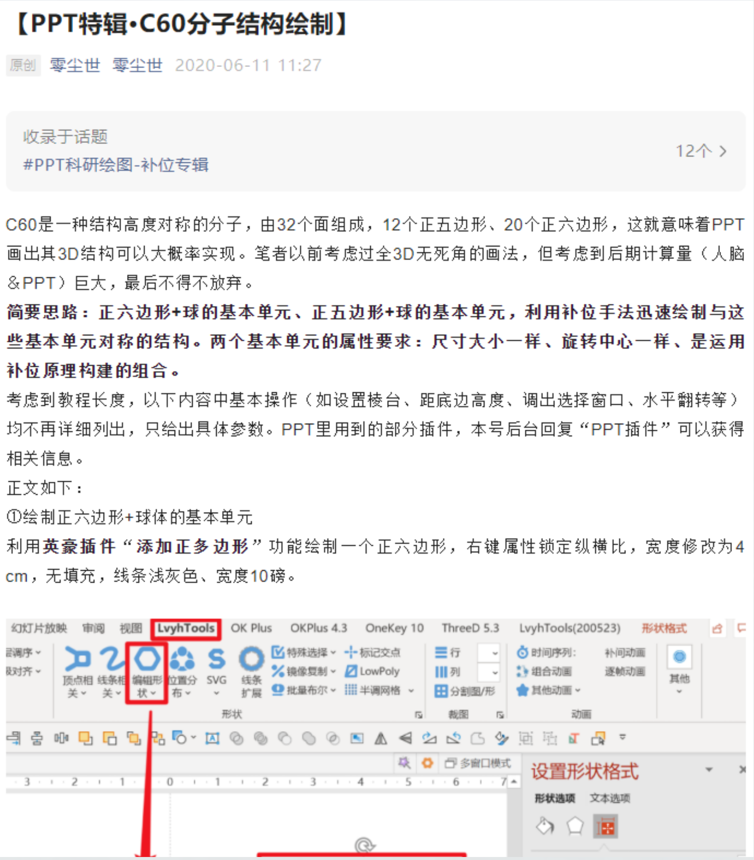


嗨！同学，PPT绘制的光路示意图来了！！！

纳米发电机 2022-03-31 17:15

以下文章来源于伊曼如歌，作者七月sun

伊曼如歌
科研人的知识加油站！



【PPT特辑·C60分子结构绘制】

原创 零尘世 零尘世 2020-06-11 11:27

收录于话题
#PPT科研绘图-补位专辑 12个 >

C60是一种结构高度对称的分子，由32个面组成，12个正五边形、20个正六边形，这就意味着PPT画出其3D结构可以大概率实现。笔者以前考虑过全3D无死角的画法，但考虑到后期计算量（人脑&PPT）巨大，最后不得不放弃。

简要思路：正六边形+球的基本单元、正五边形+球的基本单元，利用补位手法迅速绘制与这些基本单元对称的结构。两个基本单元的属性要求：尺寸大小一样、旋转中心一样、是运用补位原理构建的组合。

考虑到教程长度，以下内容中基本操作（如设置棱台、距离边高度、调出选择窗口、水平翻转等）均不再详细列出，只给出具体参数。PPT里用到的部分插件，本号后台回复“PPT插件”可以获得相关信息。

正文如下：

①绘制正六边形+球体的基本单元

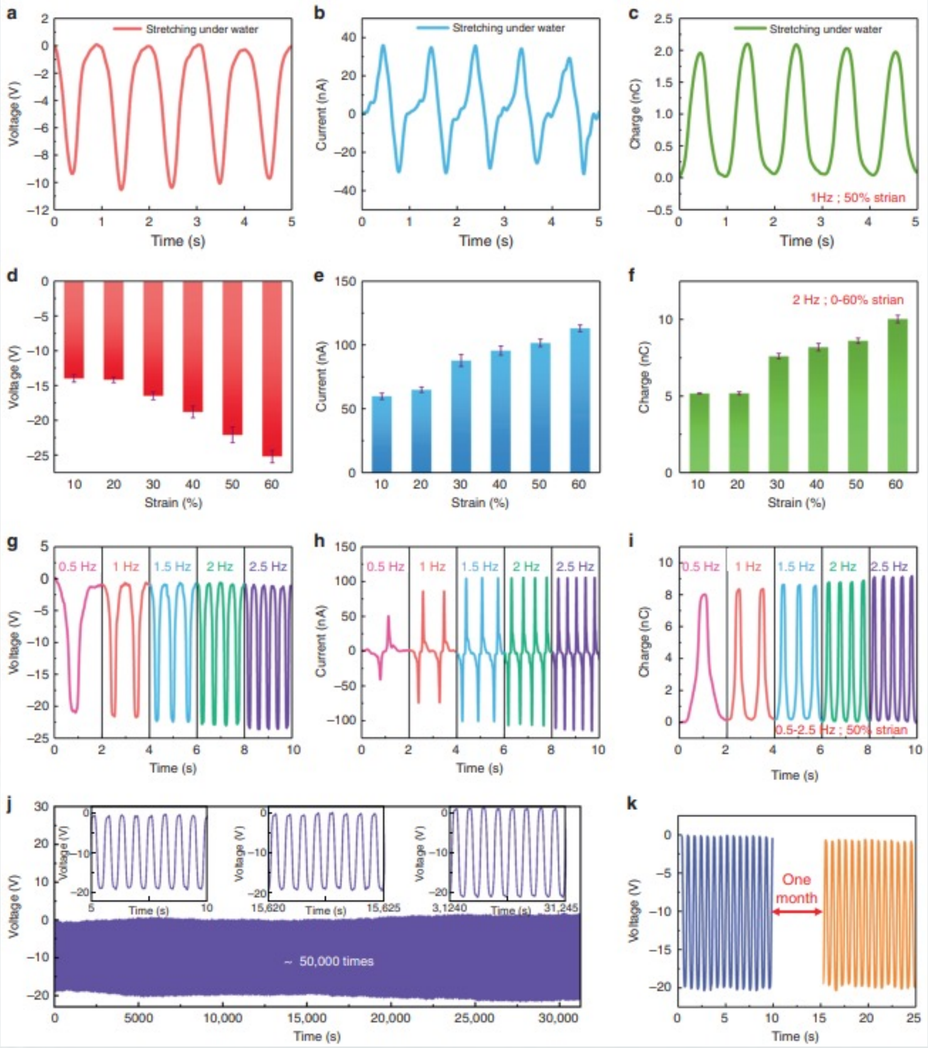
利用**英豪插件“添加正多边形”**功能绘制一个正六边形，右键属性锁定纵横比，宽度修改为4 cm，无填充，线条浅灰色、宽度10磅。

形状格式的调整、插件的选择等

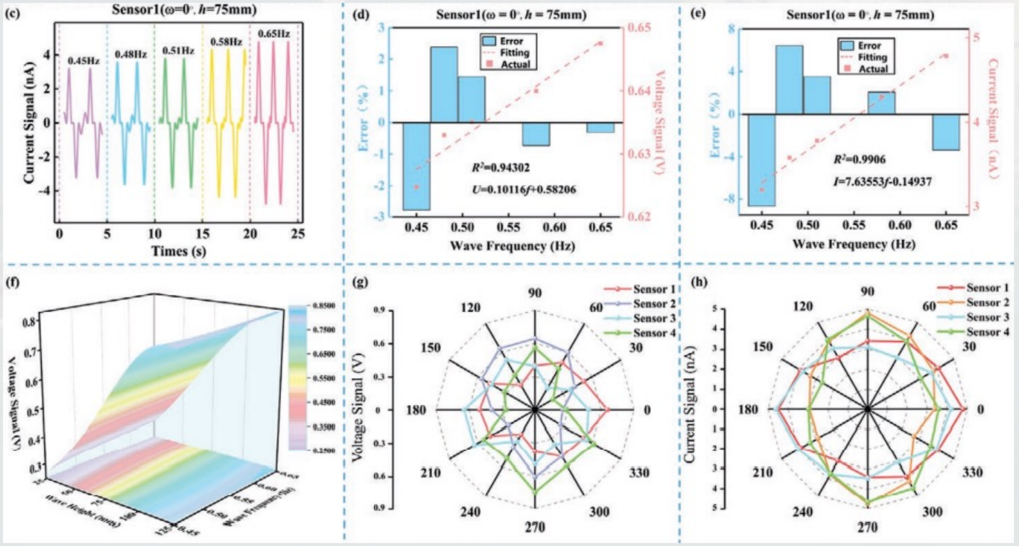
自学平台：B站、公众号等

论文数据图的绘制

- Origin作图长宽比一般为**1:1**，便于和其他图片拼合
- 坐标轴的主刻度尺朝内，图片高度3-4 cm, 字号8 pt
- 坐标轴0.5或0.75 pt，曲线线条0.75或1 pt
- 推荐Origin输出Tiff图在PPT中做后期，图片文字大小、线条粗细**保持一致**
- 对多个变量合理使用渐变色，会使逻辑更加清楚
- **多样性**：雷达图、矩阵图、极坐标等



Zhou Li et al., *Nature communication*, 2019



Xinyu Wang et al., *Adv. Mater. Technol.*, 2021

论文toc图的制作

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ARTICLE

Artificial Intelligence of Things (AIoT) Enabled Floor Monitoring System for Smart Home Applications

Qiongfeng Shi, Zixuan Zhang, Yanqin Yang, Xuechuan Shan, Budiman Salam, and Chengkuo Lee*

Cite This: https://doi.org/10.1021/acsnano.1c07579 Read Online

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ABSTRACT: To enable smart homes and relative applications, the floor monitoring system with embedded triboelectric sensors has been proven as an effective paradigm to capture the ample sensory information from our daily activities, without the camera-associated privacy concerns. Yet the inherent limitations of triboelectric sensors such as high susceptibility to humidity and long-term stability remain a great challenge to develop a reliable floor monitoring system. Here we develop a robust and smart floor monitoring system through the synergistic integration of highly reliable triboelectric coding mats and deep-learning-assisted data analytics. Two quaternary coding electrodes are configured, and their outputs are normalized with respect to a reference electrode, leading to highly stable detection that is not affected by the ambient parameters and operation manners. Besides, due to the universal electrode pattern design, all the floor mats can be screen-printed with only one mask, rendering higher facileness and cost-effectiveness. Then a distinctive coding can be implemented to each floor mat through external wiring, which permits the parallel-array connection to minimize the output terminals and system complexity. Further integrating with deep-learning-assisted data analytics, a smart floor monitoring system is realized for various smart home monitoring and interactions, including position/trajectory tracking, identity recognition, and automatic controls. Hence, the developed low-cost, large-area, reliable, and smart floor monitoring system shows a promising advancement of floor sensing technology in smart home applications.

KEYWORDS: floor monitoring, artificial intelligence, deep learning, triboelectric nanogenerator, smart home, coding

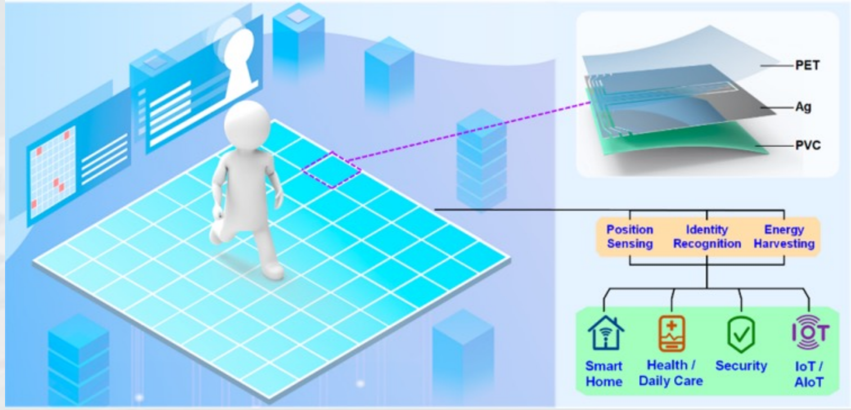
Chengkuo Lee et al., *ACS nano*, 2021

保持美观 保证凝练

Toc：Table of content/Graphical Abstract

Specifications

- The graphic should be in the form of a structure, graph, drawing, photograph, or scheme—or a combination.
- Text should usually be limited to the labeling of compounds, reaction arrows, and diagrams. Long phrases or sentences should be avoided.
- Submit the graphic at the actual size to be used for the TOC so that it will fit in an area no larger than 3.25 inches by 1.75 inches (approx. 8.25 cm by 4.45 cm).
- Use a sans serif font type such as Helvetica, preferably at 8 pt. but no smaller than 6 pt. Do not make the reader strain to read it. The type should be of high quality in order to reproduce well.
- The graphic file should be saved as either:
  - TIFF at 300 dpi for color and at 1200 dpi for black and white.
  - EPS in RGB document color mode with all fonts converted to outlines or embedded in the file.
- Label the graphic "For Table of Contents Only" and provide it on the last page of the submitted manuscript.



宽度不超

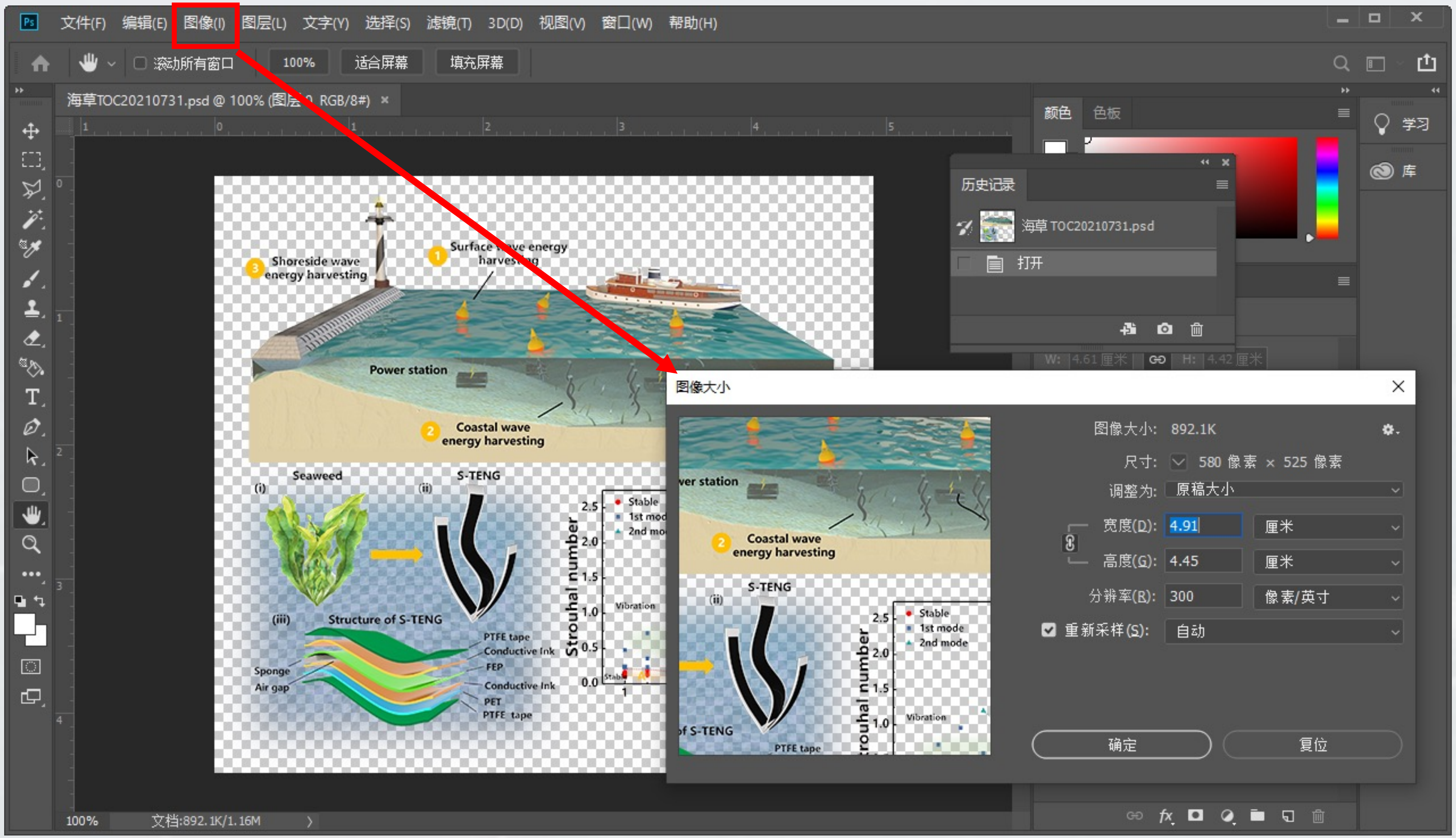
4.45cm

长度不超

8.25cm

300DPI

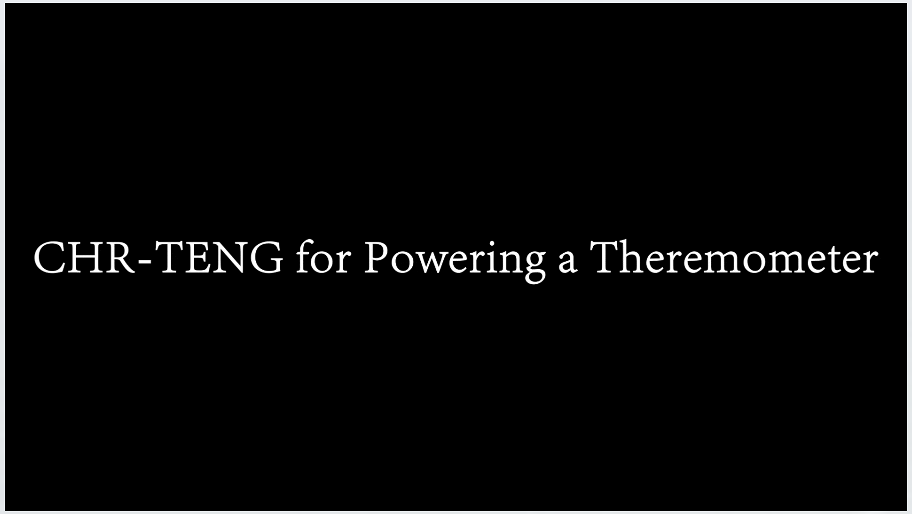
论文toc图的制作—PS工作窗口



注意：若Toc里有文字说明，请在处理完图片后在PPT上另加文字

否则图像缩小后文字将变得模糊！

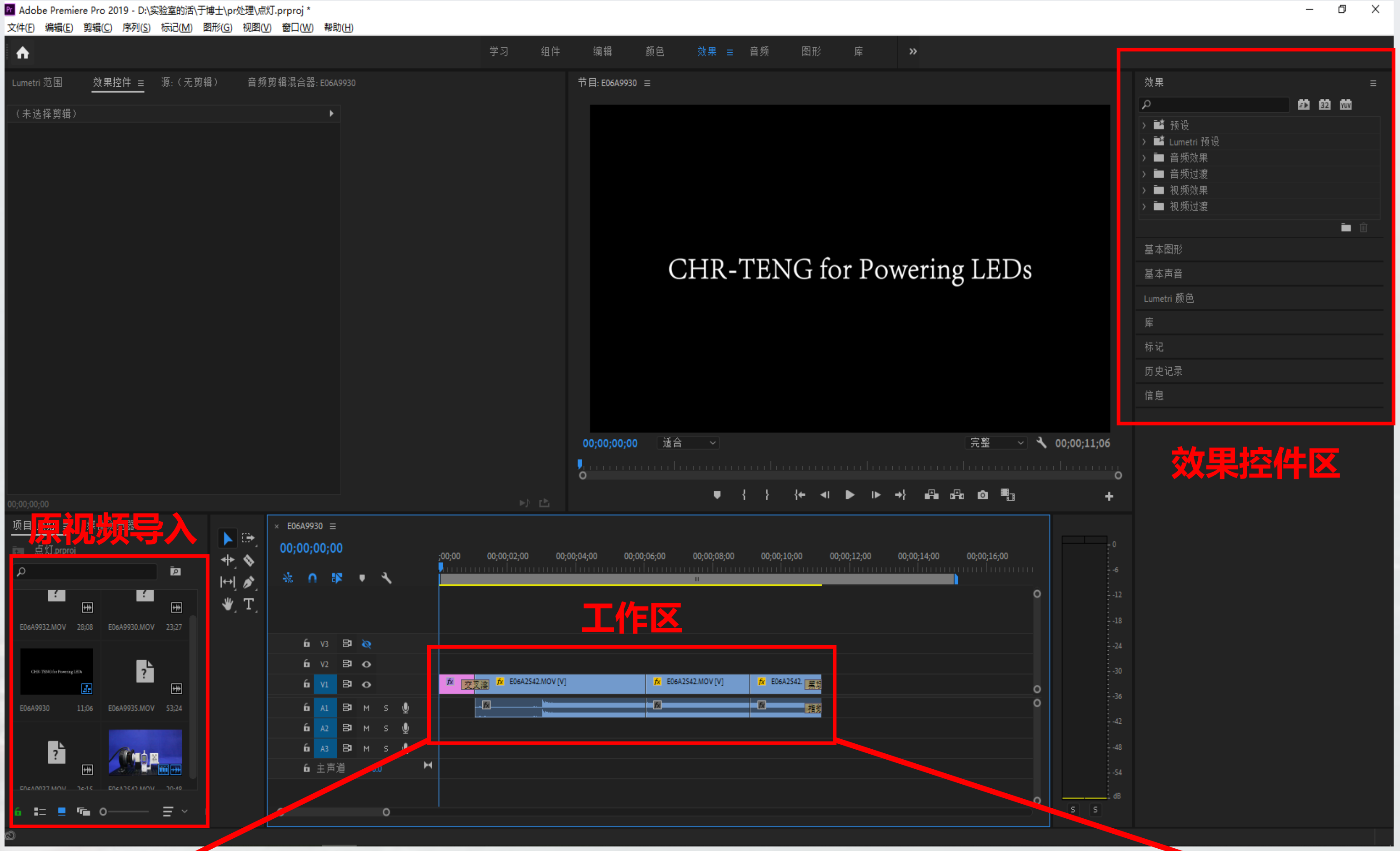
论文demo的制作—Pr工作窗口

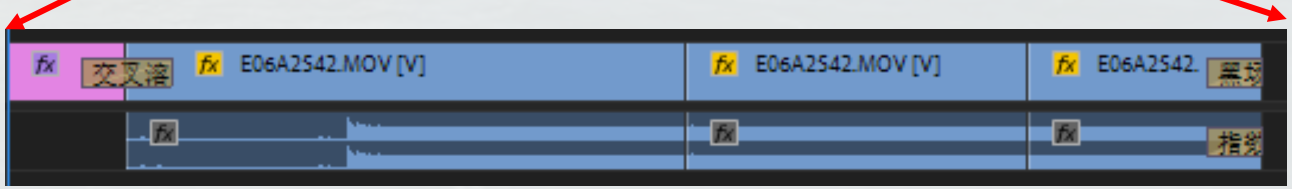


Haichao Yuan et al., *Nanomaterials*, 2021

Tips

1. 原视频录制过程中保持无环境杂音
2. 保持录制设备的固定/稳定运镜
3. 导出**中等比特率**，文件大小20M以内
4. Pr2021兼容苹果手机拍照视频





插入字幕、关键帧、转场等元素效果

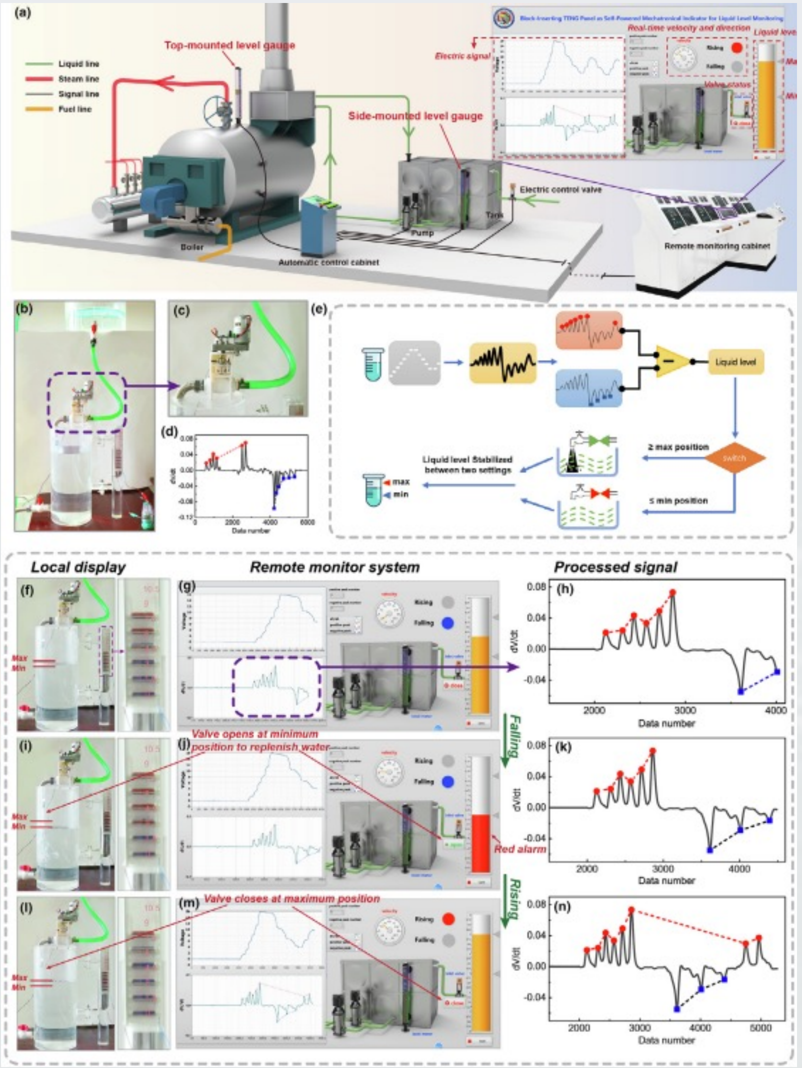
论文大图的绘制

1 科研论文配图的演变

2 科研论文配图的建议

3 常用色彩搭配网址

4 大图的构思与排版



Minyi Xu* et al., ***Materials Today***, 2021

科研论文配图的演变

1. 90年之前：

➢ 黑白灰的世界，图少数据少彩色少

2. 90-00年：

➢ 彩色图开始兴起，少数杂志要求彩色图

3. 00-10年：

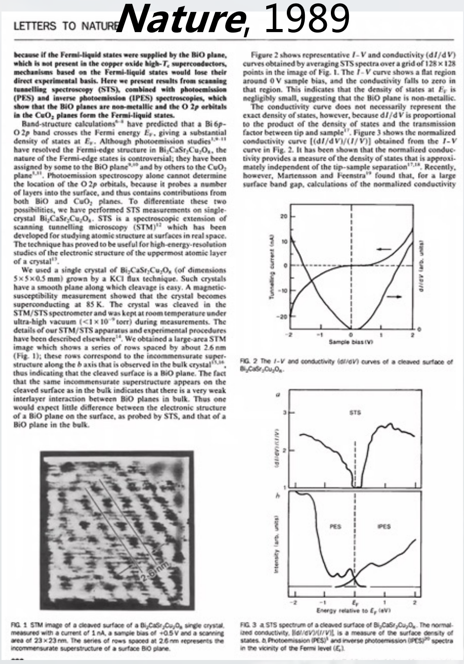
➢ 数据量增大、SI增加，彩色比重加大

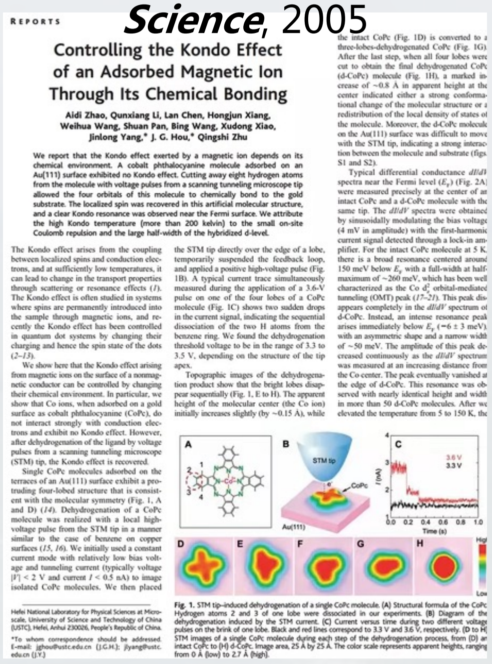
4. 10-20年：

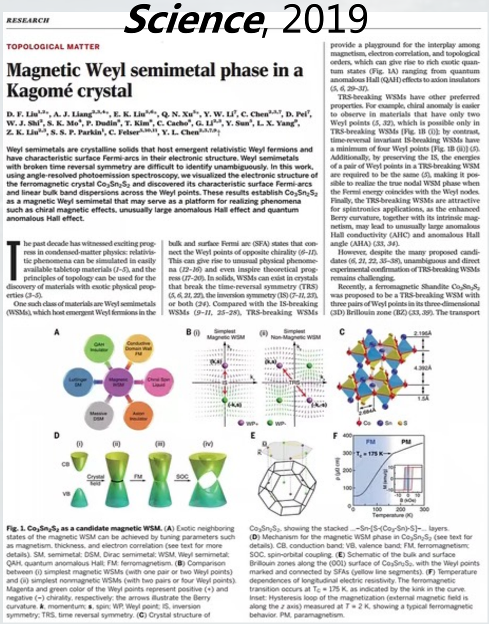
➢ 强调效果与模型、3D透视效果图运用增加

5. 未来：

➢ 虚拟现实人机交互（动画）







科研论文配图的建议

论文——用数据说话，用图片表达，用逻辑自洽

- 图片是写作中最重要的一环，要求既包含数据，又必须体现论文的逻辑关系

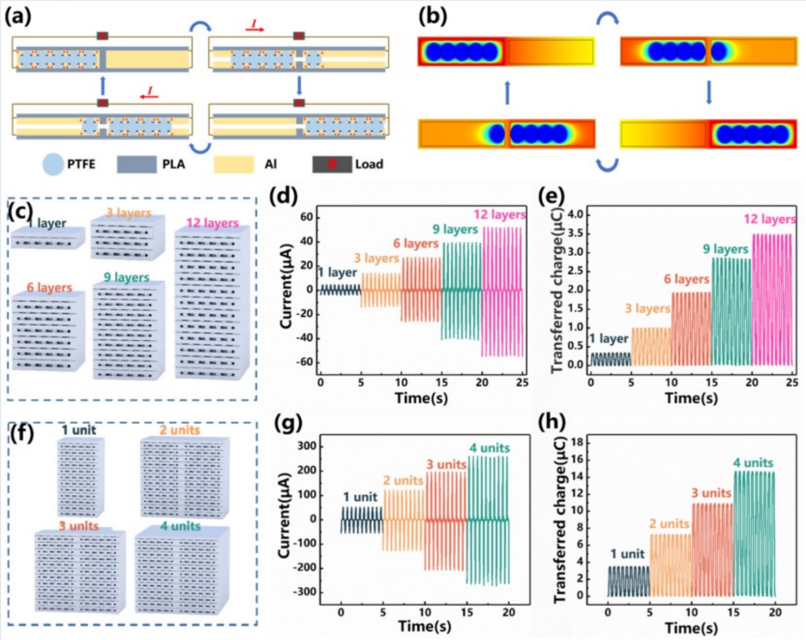
Tips

1. 配色要以突出关键数据、展示逻辑关系为**首要原则**。

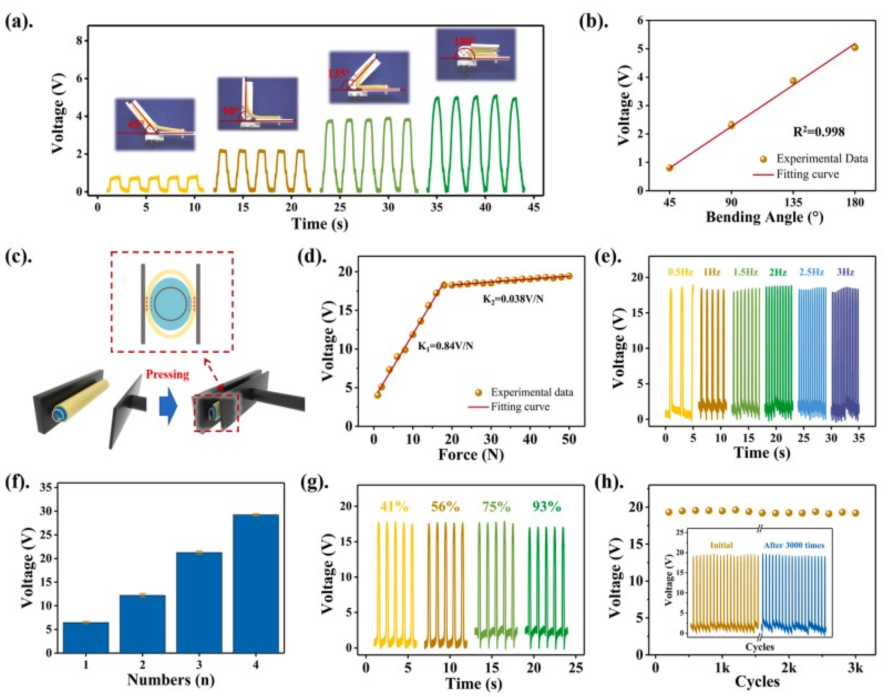
2. 尽量选**柔和**的颜色，避免过明、过暗、过亮冷色调。

3. 一篇论文的配图，选取一个**主色调**（1/3到一半）、使用**近似色**作为辅助色。其他颜色为**互补色**、**组合色**。

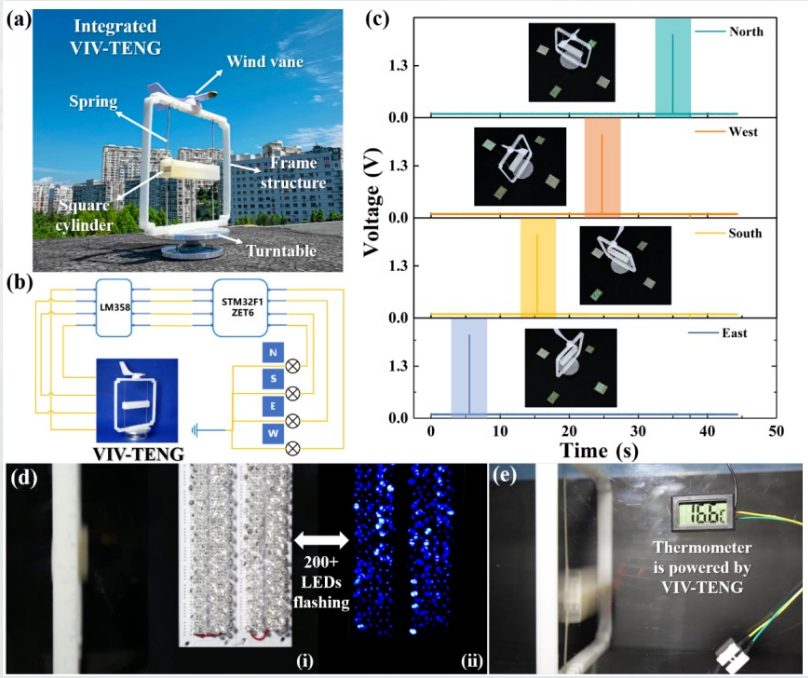
配色要以突出关键数据、展示逻辑关系为首要原则，同时尽可能采取示意图数据图相组合的形式



Hao Wang et al., ***Nanomaterials***, 2022

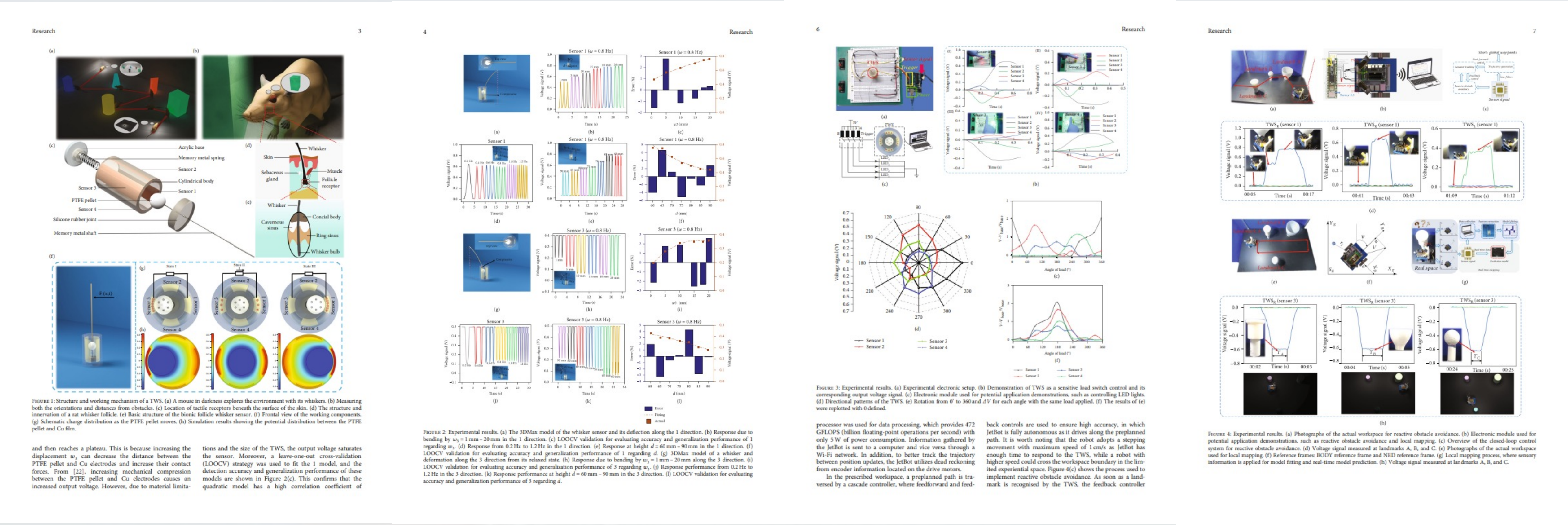


Cong Zhao et al., ***Nano energy***, 2022



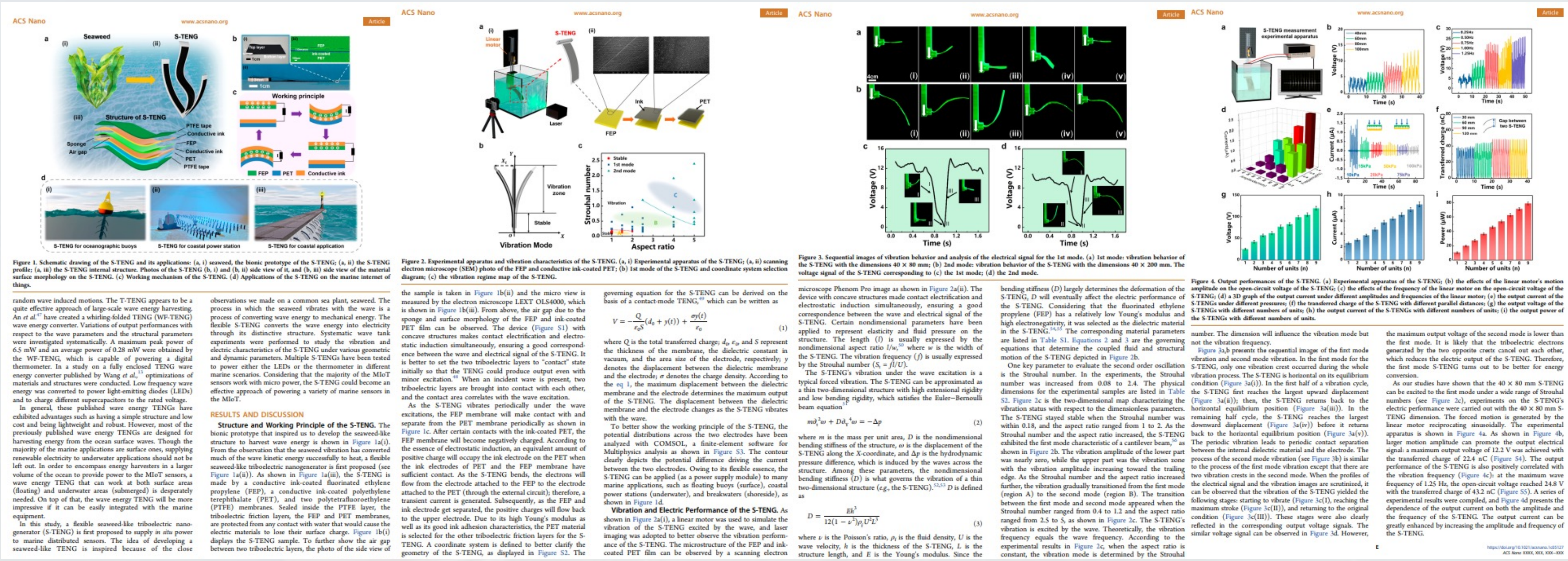
Yan Wang et al., ***Nano research***, 2021

一篇论文的配图，选取一个主色调（1/3到一半）、使用近似色作为辅助色。其他颜色为互补色、组合色



Peng Xu et al., ***Research***, 2021 **(cover paper)**

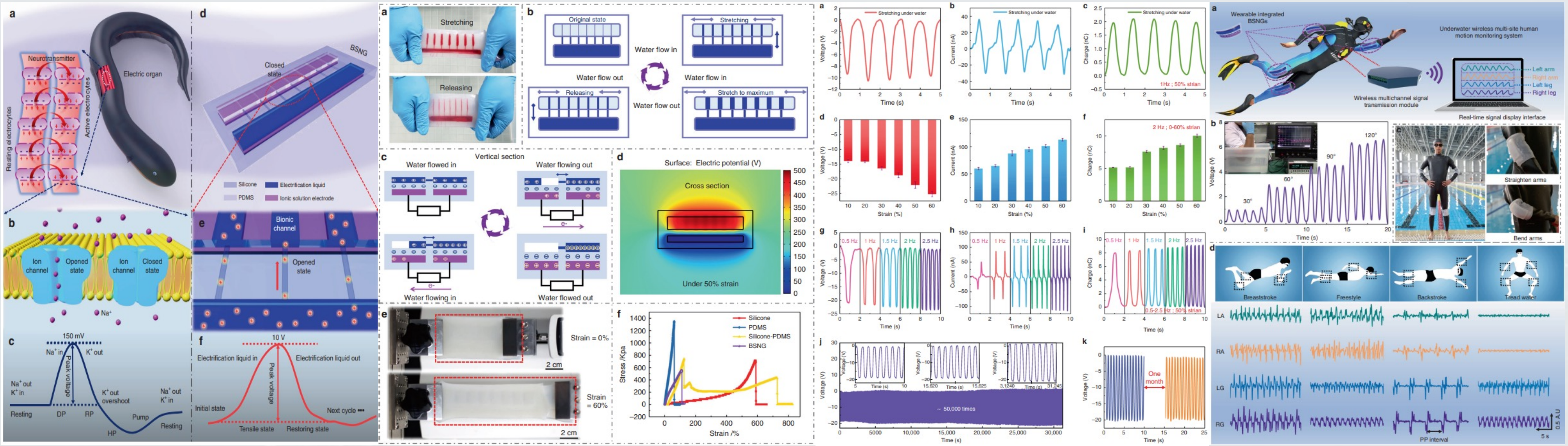
一篇论文的配图，选取一个主色调（1/3到一半）、使用近似色作为辅助色。其他颜色为互补色、组合色



Yan Wang et al., ***ACS nano***, 2021

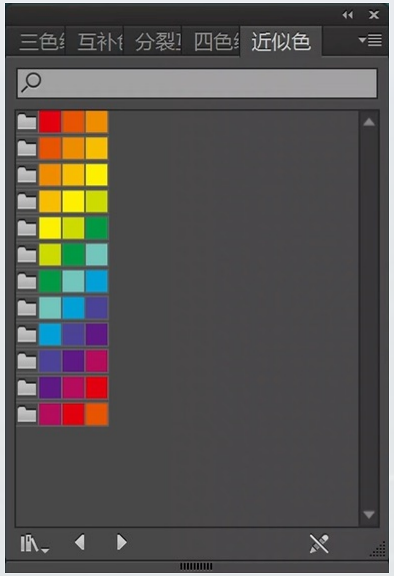
一篇论文的配图，选取一个主色调（1/3到一半）、使用近似色作为辅助色。其他颜色为互补色、组合色

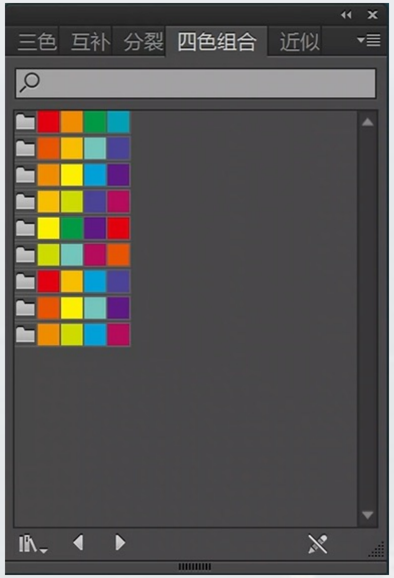
首尾呼应！

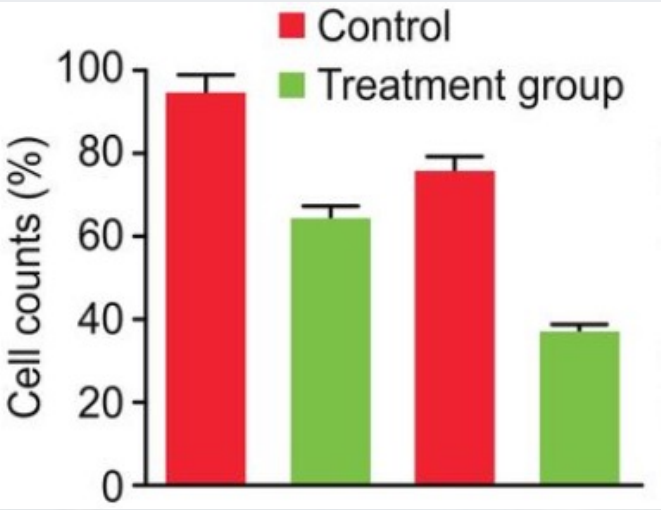


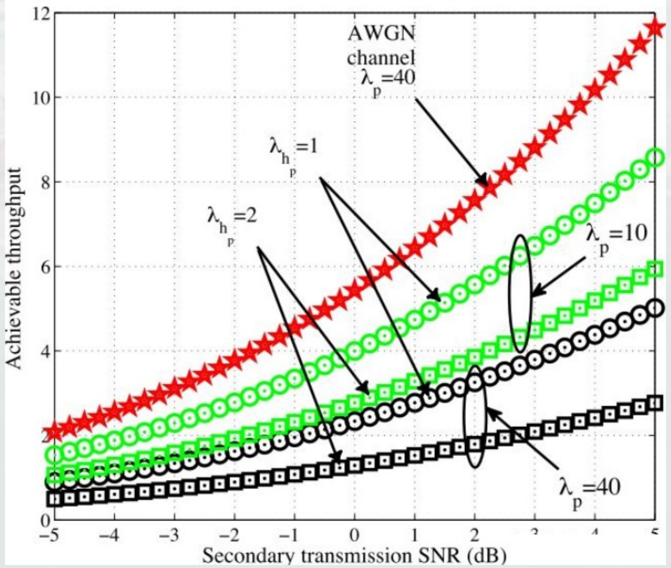
Zhou Li et al., ***Nature communication***, 2019

近似色、互补色、组合色





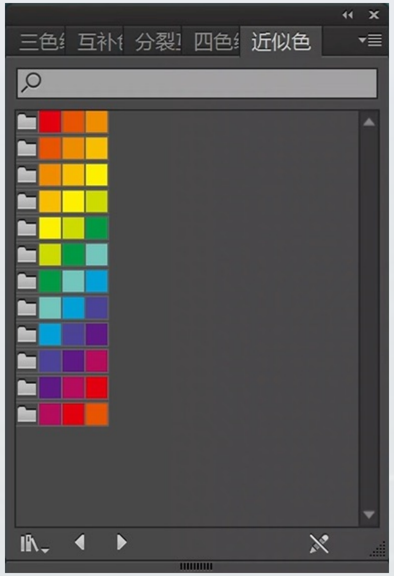


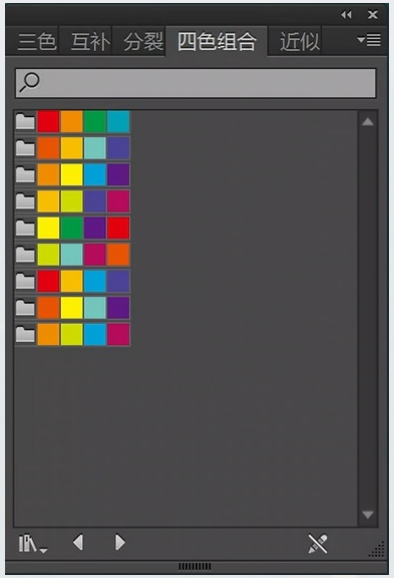


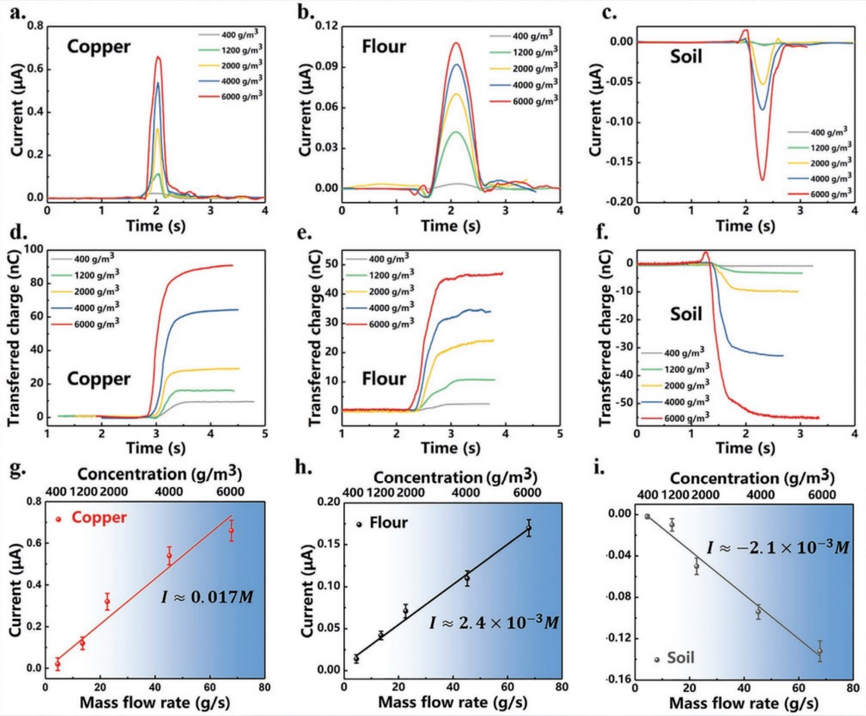
Tips

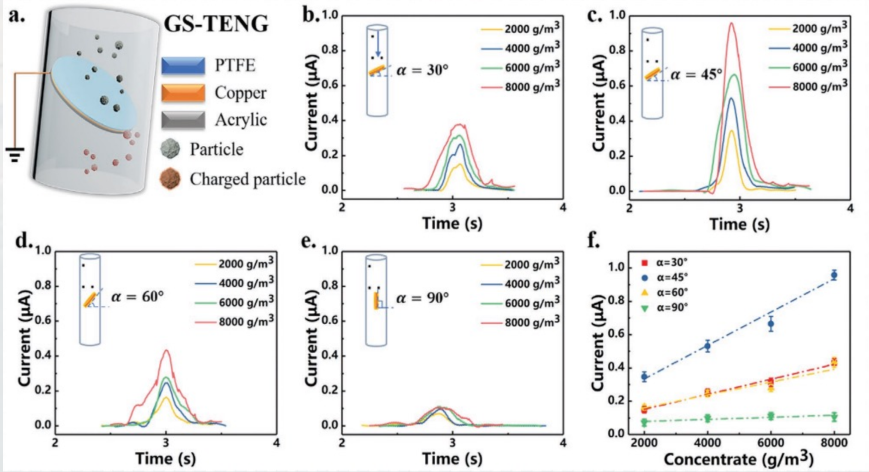
1. 两类数据之间最好不要使用互补色，三类及以上可以
2. 尽量选**柔和**的色调，避免饱和度过高/低
3. 颜色不宜过多、过杂，**避免**同一幅图中同时出现红绿色
4. 渐变背景较难驾驭，尽量用近似色

近似色、互补色、组合色







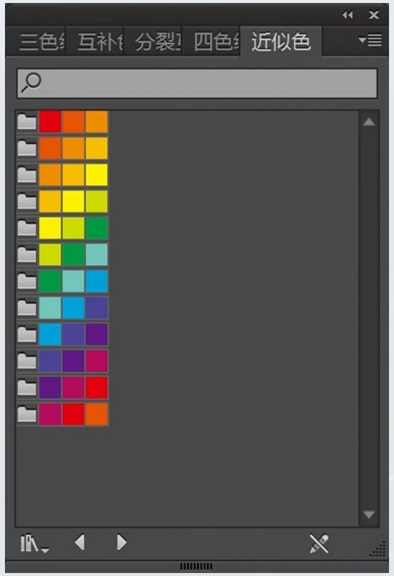


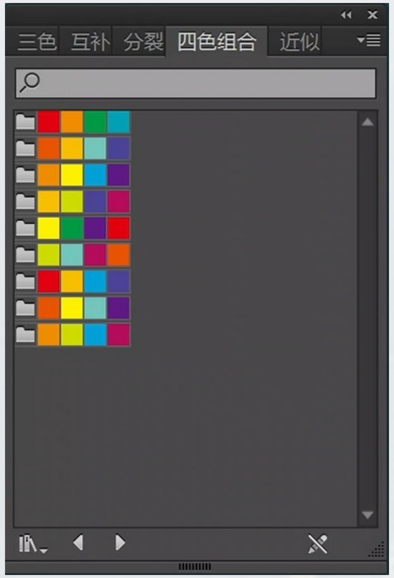
Yan Wang et al., *Adv. Mater. Technol.*, 2021

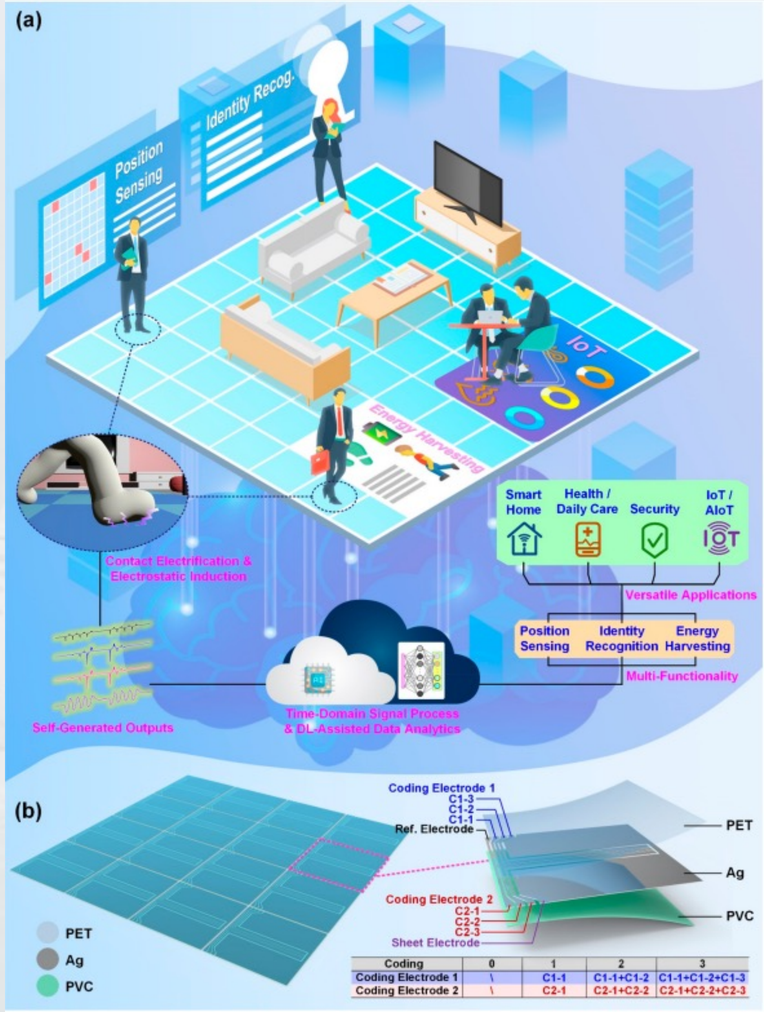
Tips

1. 两类数据之间最好不要使用红绿互补色，三类及以上可以
2. 尽量选**柔和**的色调，避免饱和度过高/低
3. 颜色不宜过多、过杂
4. 渐变背景较难驾驭，尽量用近似色

近似色、互补色、组合色





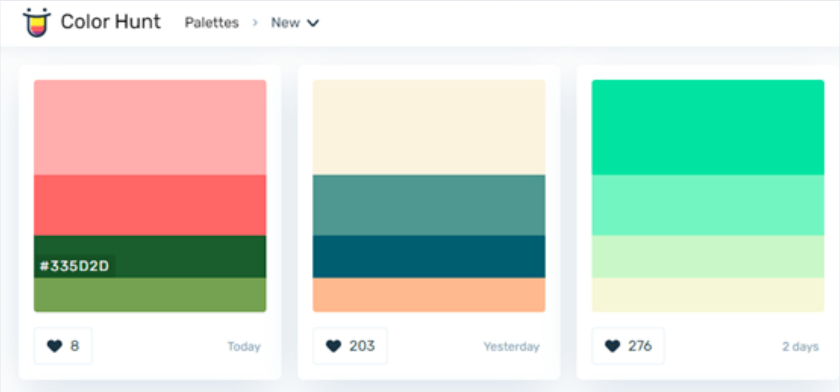


Chengkuo Lee et al., *ACS nano*, 2021

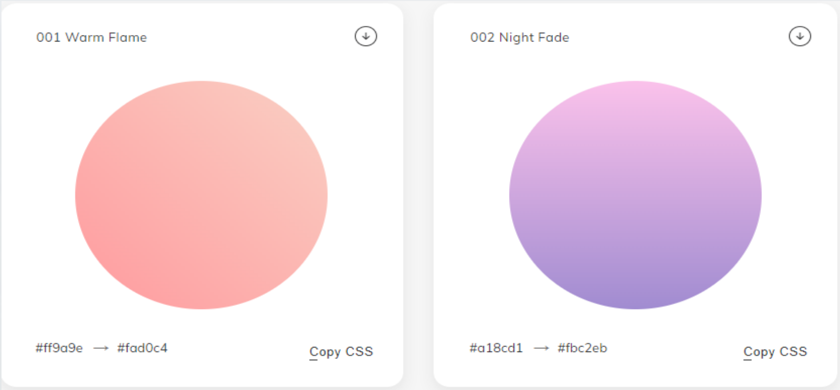
Tips

1. 两类数据之间最好不要使用互补色，三类及以上可以
2. 尽量选**柔和**的色调，避免饱和度过高/低
3. 颜色不宜过多、过杂，**避免**同一幅图中同时出现红绿色
4. 渐变背景较难驾驭，尽量用近似色

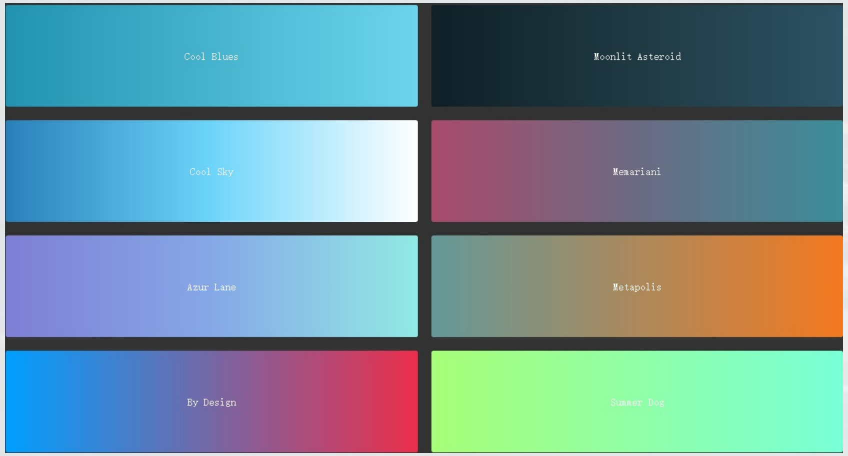
常用的配色网站



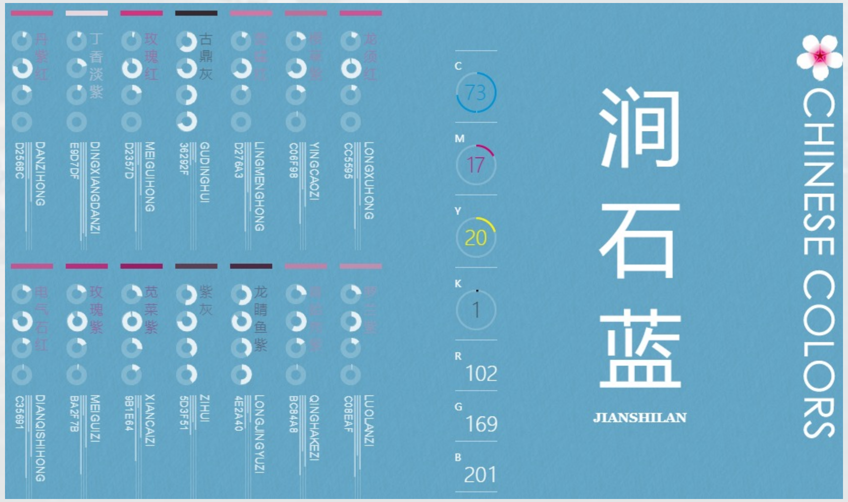
https://colorhunt.co/



https://webgradients.com/



https://uigradients.com/



http://zhongguose.com/

论文大图的构思与排版

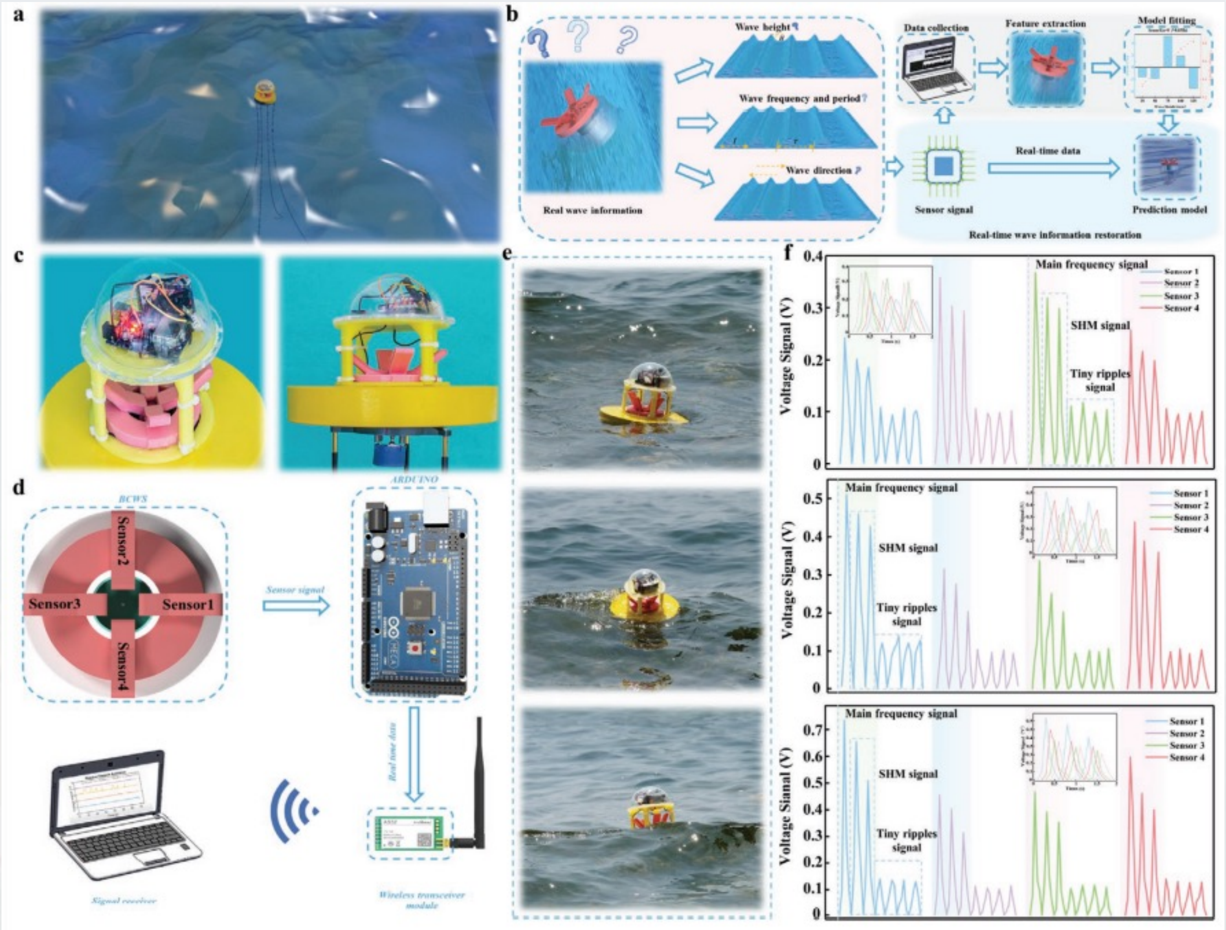
1. 正文部分整体框架（5-6张大图）

- 场景、器件（1-2张）
- 实验部分（2-4张）
- 实验演示（1张）
- **每部分之间逻辑递进**

2. 每一部分格局框架

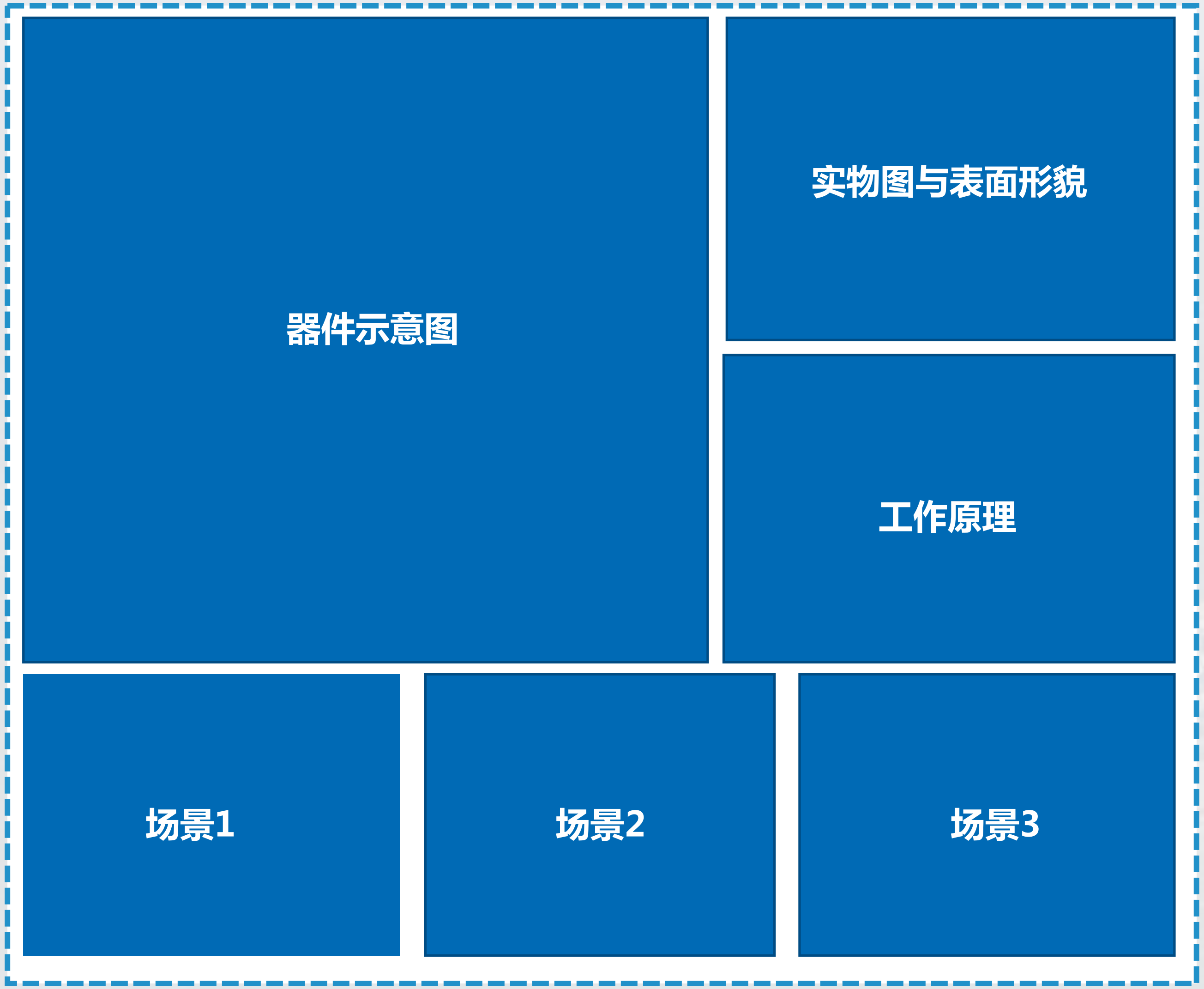
- 美化排版（3×2/2×2）
- 实验部分不建议做2×3
- 每张小图不一定等大（虚线框架）
- **错落有致、分布均匀**
- 多余的数据放Supporting Information

先定框架再下笔！



Xinyu Wang et al., *Adv. Mater. Technol.*, 2021

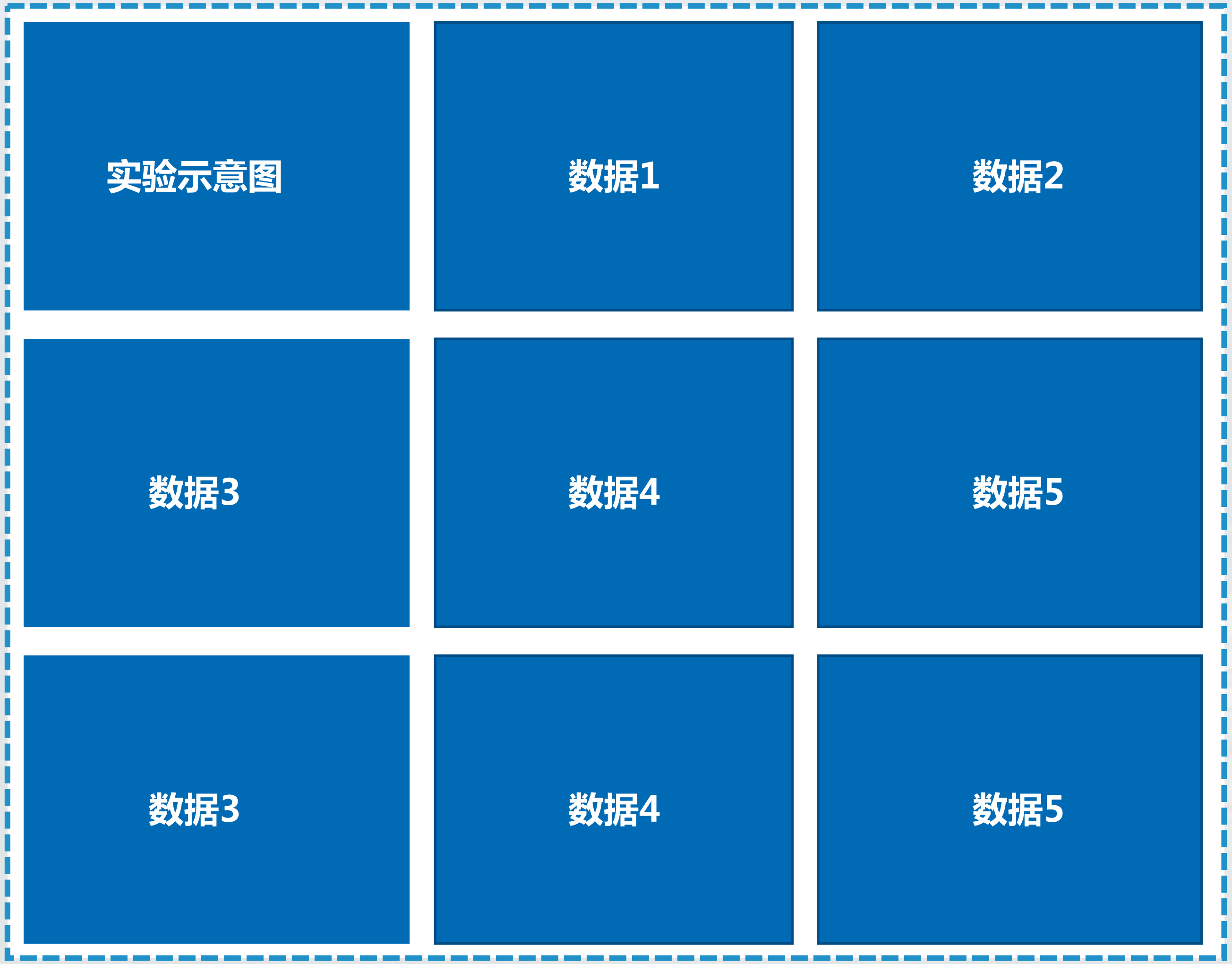
论文大图的构思与排版



Tips

1. 背景全白（RGB255）/透明
2. 不一定构建外部框架
3. 图片等大、对齐
4. 图片文字批注不用艺术字、不斜体
5. 先定框架，再做细节处理
6. 图片去白对齐、柔化边缘、亮度锐化
7. 用数据图填满大图，而不是用示意图填满大图！

论文大图的构思与排版



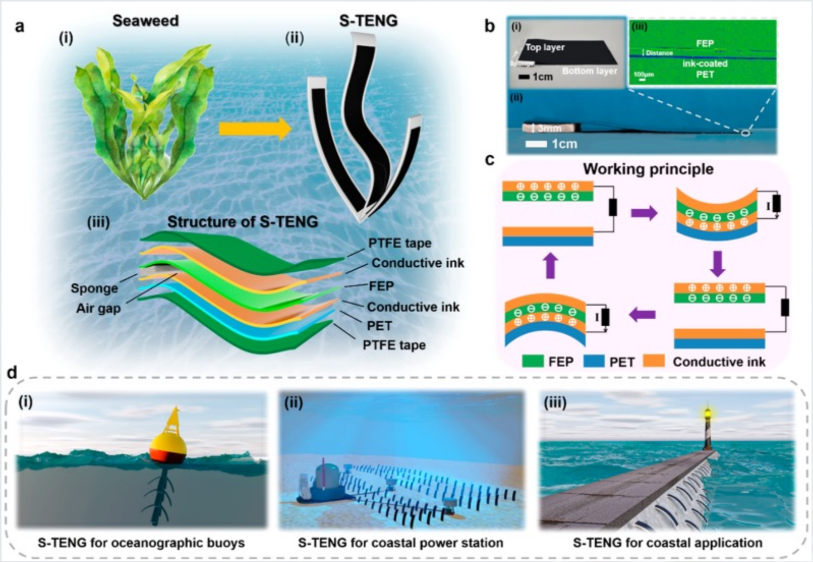
一张六宫格实验数据图的文章工作量远远不够！

论文的本质依然是**用数据说话**！

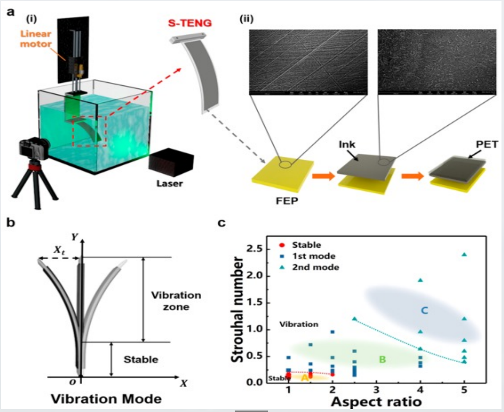
Tips

1. 背景全白（RGB255）/透明
2. 不一定构建外部框架
3. 图片等大、对齐
4. 图片文字批注不用艺术字、不斜体
5. 先定框架，再做细节处理
6. 图片去白对齐、柔化边缘、亮度锐化
7. 用数据图填满大图，而不是用示意图填满大图！
8. 择优择重点，多余的图放SI

总—分—总

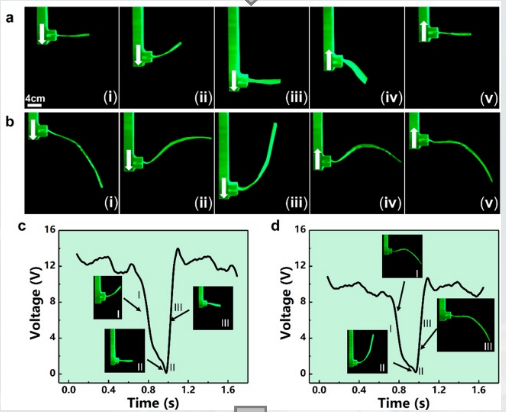


总：× ×场景提出× ×器件

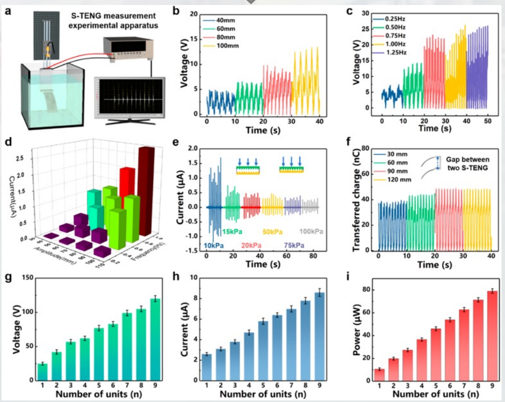


动力学模型

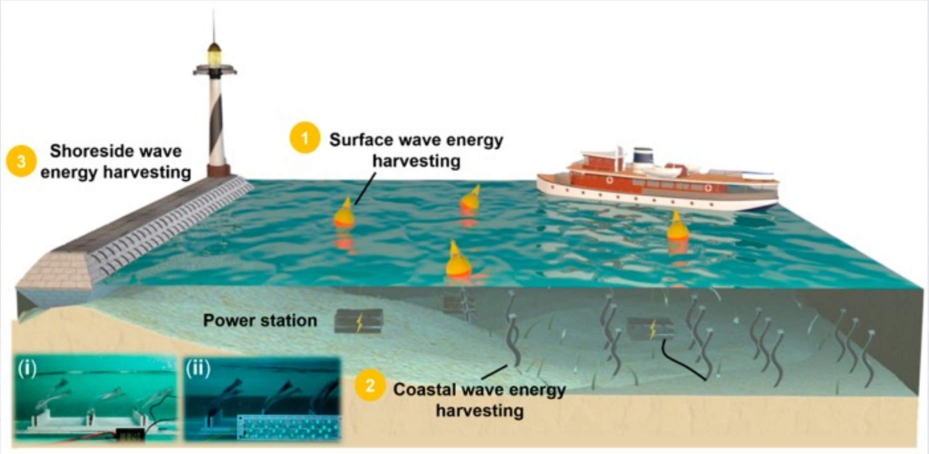
实验装置



摆动特性



最优解（是什么，怎么样）



总：× ×器件未来应用于× ×场景

Yan Wang et al., ***ACS nano***, 2021

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大连海事大学
DALIAN MARITIME UNIVERSITY

文献汇报PPT的构思与排版

1. 逻辑梳理

- 摘要（为什么做、怎么做、结论与展望）
- 研究背景（1页）、实验部分（3-6页）、结论（1页）
- 每部分体现**逻辑递进**

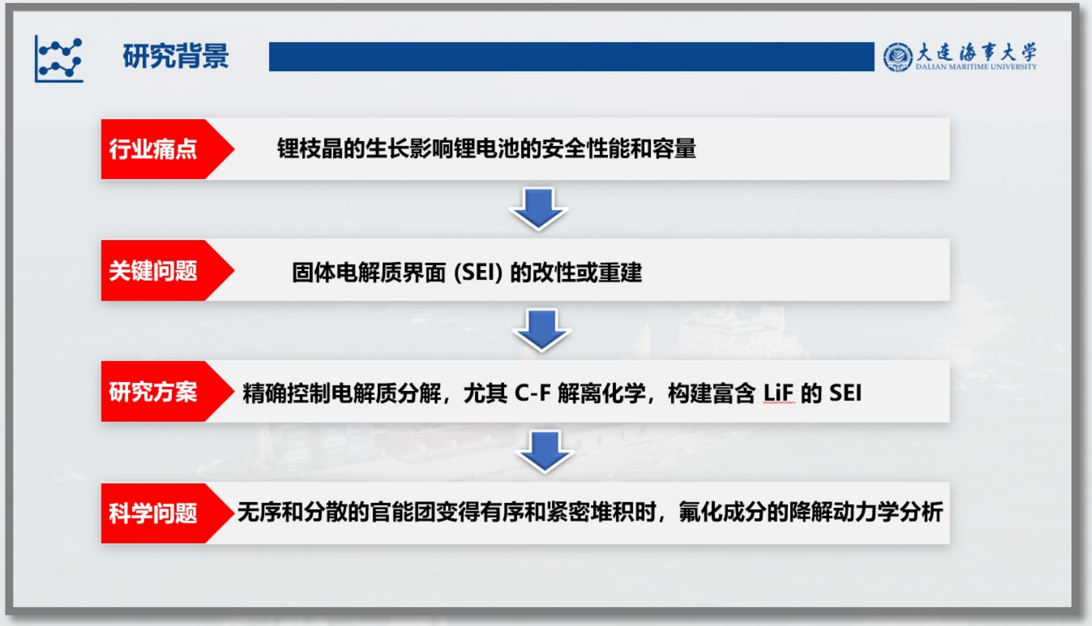
2. 每一部分排版

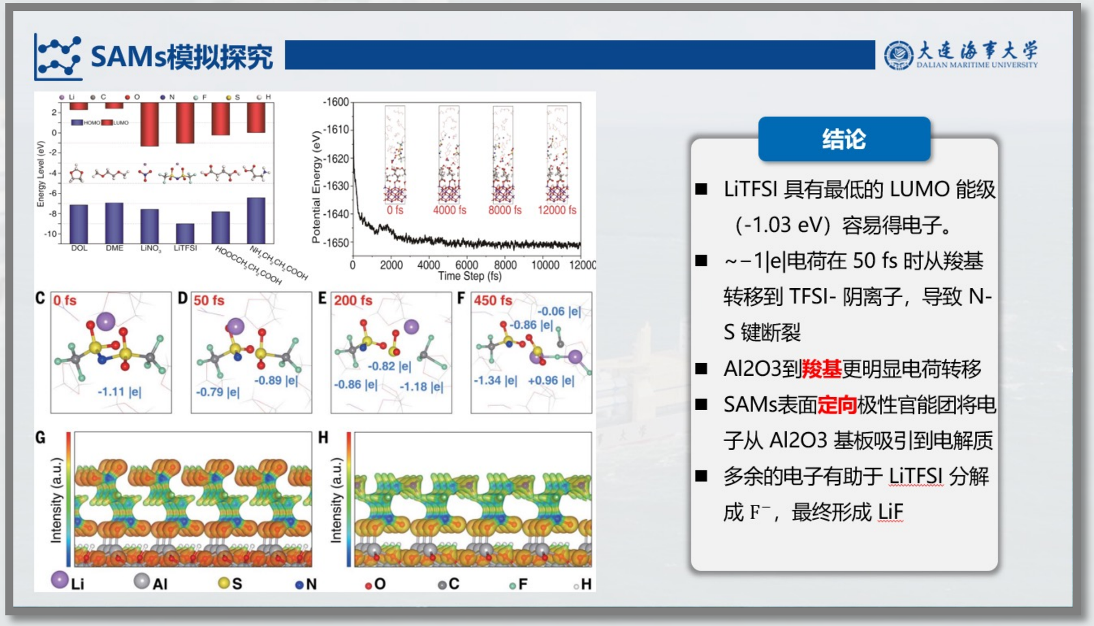
- 研究背景采用递进式
- 主体部分采用图片+结论（左右式、上下式）
- 图文并茂，不等于所有图文复制粘贴！
- 关键字/词/句的**提炼与标注**

汇报过程又快又准

让别人看懂，让自己说透

体现汇报人自己的思考





工作汇报PPT的构思与排版

1. 逻辑梳理

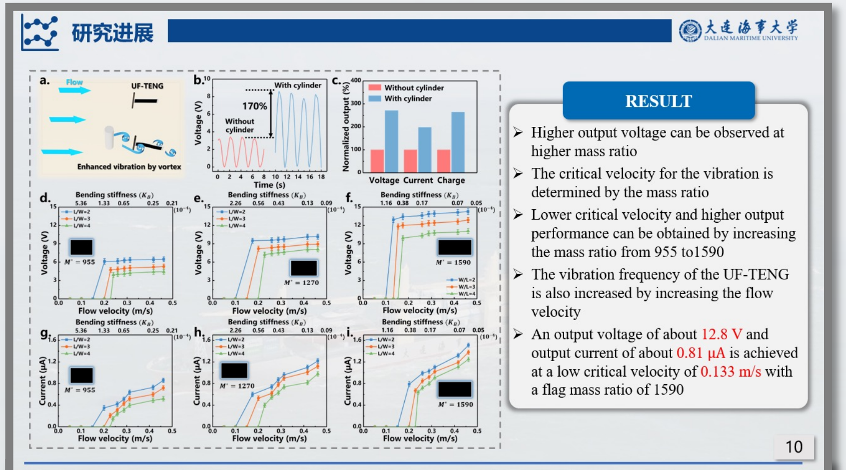
- 研究背景、工作进展、下一步计划
- 合适的**应用场景**—国内外现状—TENG
- TENG只是一项技术，并非一件产品！

2. 排版方式

- 研究背景（1-2页）、**实验进展**（3-6页）结论（1页）
- 图文并茂、关键字/词/句的**提炼与标注**
- “主线任务”（多页）与“支线任务”（1页）进行排版
- 按照时间线定期排列、按进度表定期总结（1页）

重视**迭代过程**，保存平时的后处理照片/数据图

多拍照，无意的照片可能会是整项工作的点睛之笔！



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DALIAN MARITIME UNIVERSITY

总结与心得

技巧很重要，但**逻辑思维**更重要

- 审美需建立在整体性分析上
- 作图/PPT过程体现逻辑
- 保持美观、易懂、趣味性与科学性

Tips

1. 对整体的把控多思考。
2. 对细节的处理多练习。
3. 多参加学术讲座提升自己大局观和思维能力勤能补拙，多学习、多动手锻炼自己。

常用科研软件

1.三维模型建立/绘制

- Solidworks
- CAD

2. 模型渲染

- Cinema 4D
- 3dmax/ Maya
- Keyshot

3. 后处理

- Ps/ PPT（位图）
- Ai（矢量图）
- Pr/ Ae

4. 实验图绘制

- Origin
- Matlab
- python

5. 文档编辑与文献管理

- Office/ WPS
- Adobe Acrobat Reader DC
- Mendeley/ EndNote

6. 其他

- LabVIEW
- COMSOL
- Ansys

学汇百川 德济四海

Thank You !