

科技馆流体力学展品调研

哈尔滨工业大学（深圳）

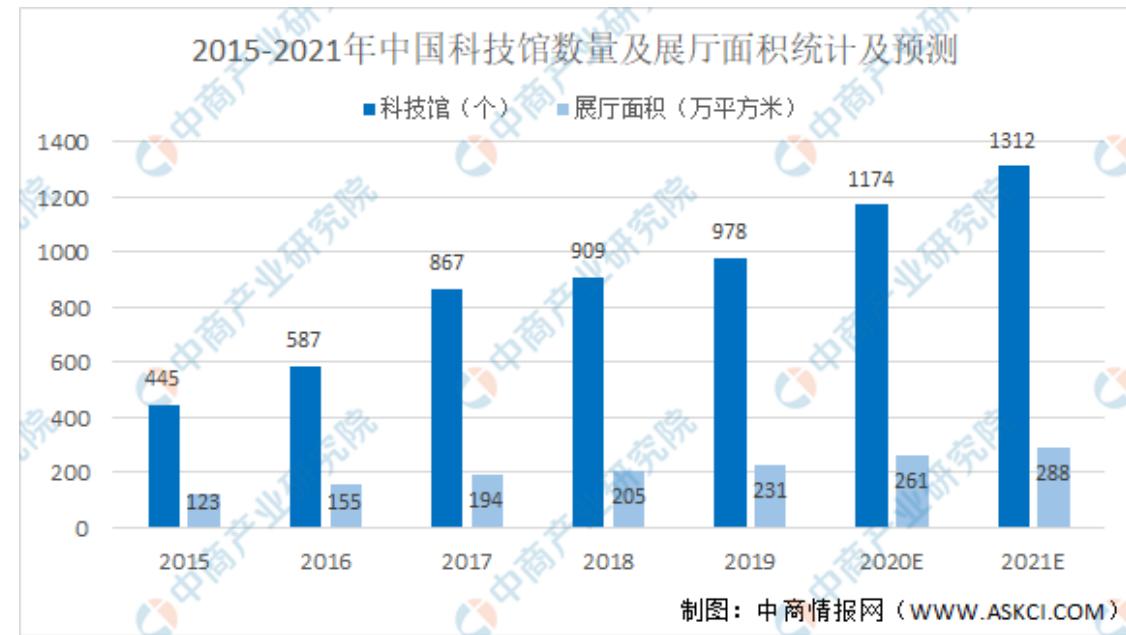
高南 副教授

nangao@yahoo.com

2021-12-18

背景

- 科技部：“科普场馆建设整体向好，场馆数量和展厅面积有所增加。2020年全国共有科技馆和科学技术类博物馆**1525**个，比2019年增加48个。其中，科技馆573个，科学技术类博物馆952个。”



科普展品目的

- 让孩子去看、去碰、去玩
- 展品要有
 - 趣味性
 - 与生活相关
 - 可现场操作
 - 直观性
 - 流动显示
 - 科学性
 - 覆盖科学原理
 - 目的不是教原理，而是赋予少年儿童直观印象
- 使未来学习过程变得更容易



目前科技馆常见的项目

- 风洞（风管、风箱）
 - 压强
 - 气动力
- 涡
 - 转动
- 水利
 - 能量
 - 动量



绵阳科技馆：娱乐风洞



【科技馆】绵阳科技馆



放飞自我,绵阳科技馆娱乐风洞等你来high

低速风洞



2021/12/18

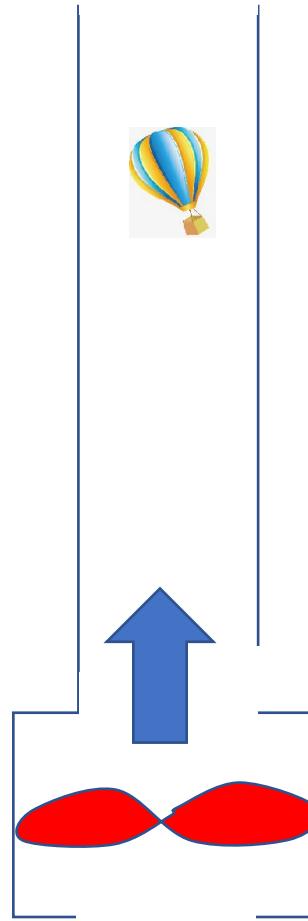
2021年全国力学科普工作研讨会

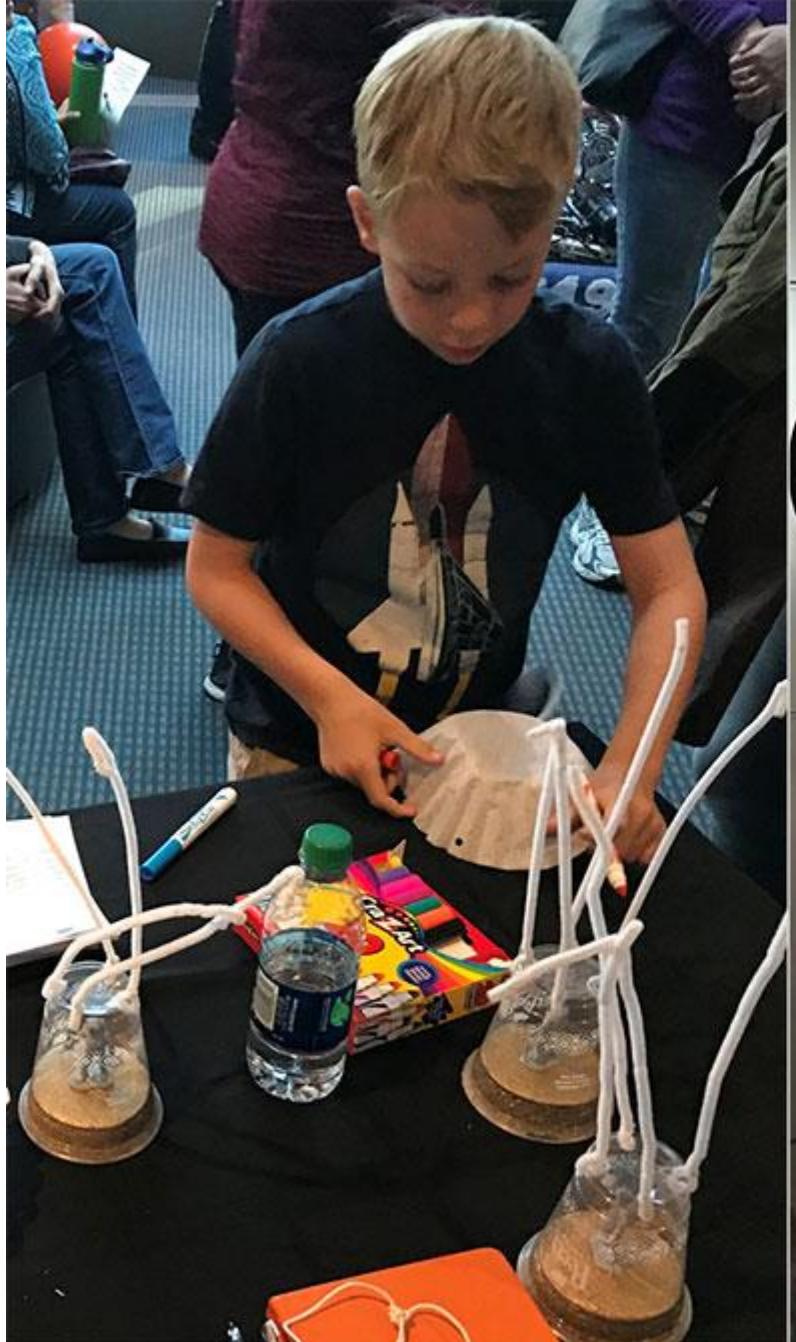
- 东京科技馆
- 直流、闭口
- 转台，可控
- 建筑物模型
- 风标显示近壁流场方向

力：竖直风洞



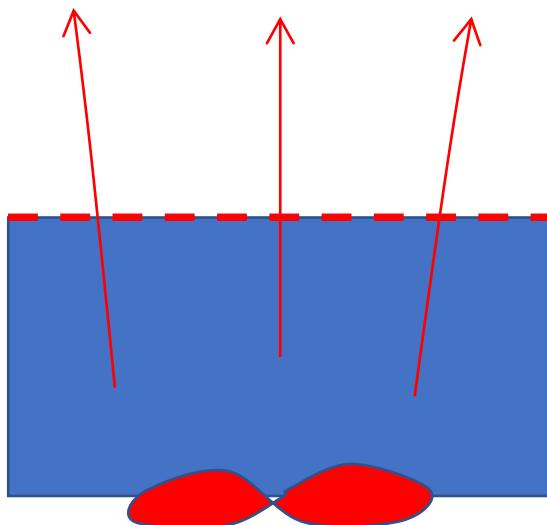
[Fluid Dynamics - Carnegie Science Center](#)





Quest Science Center

力：竖直风洞



力、压：旋风箱

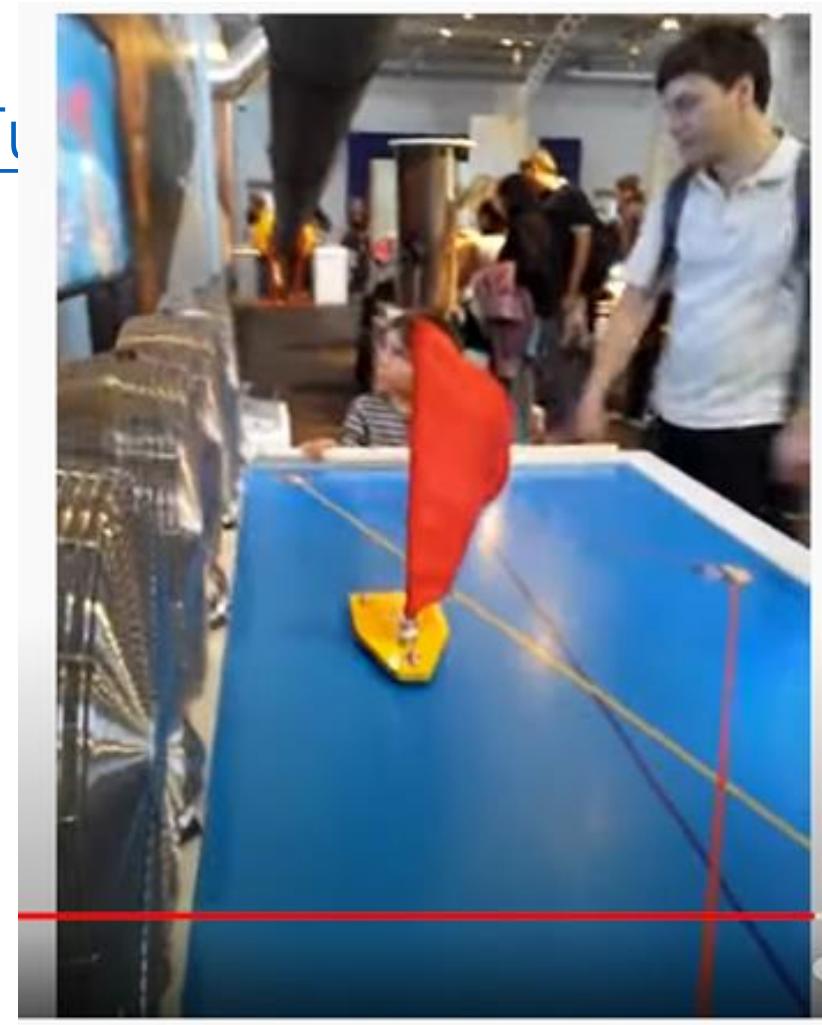
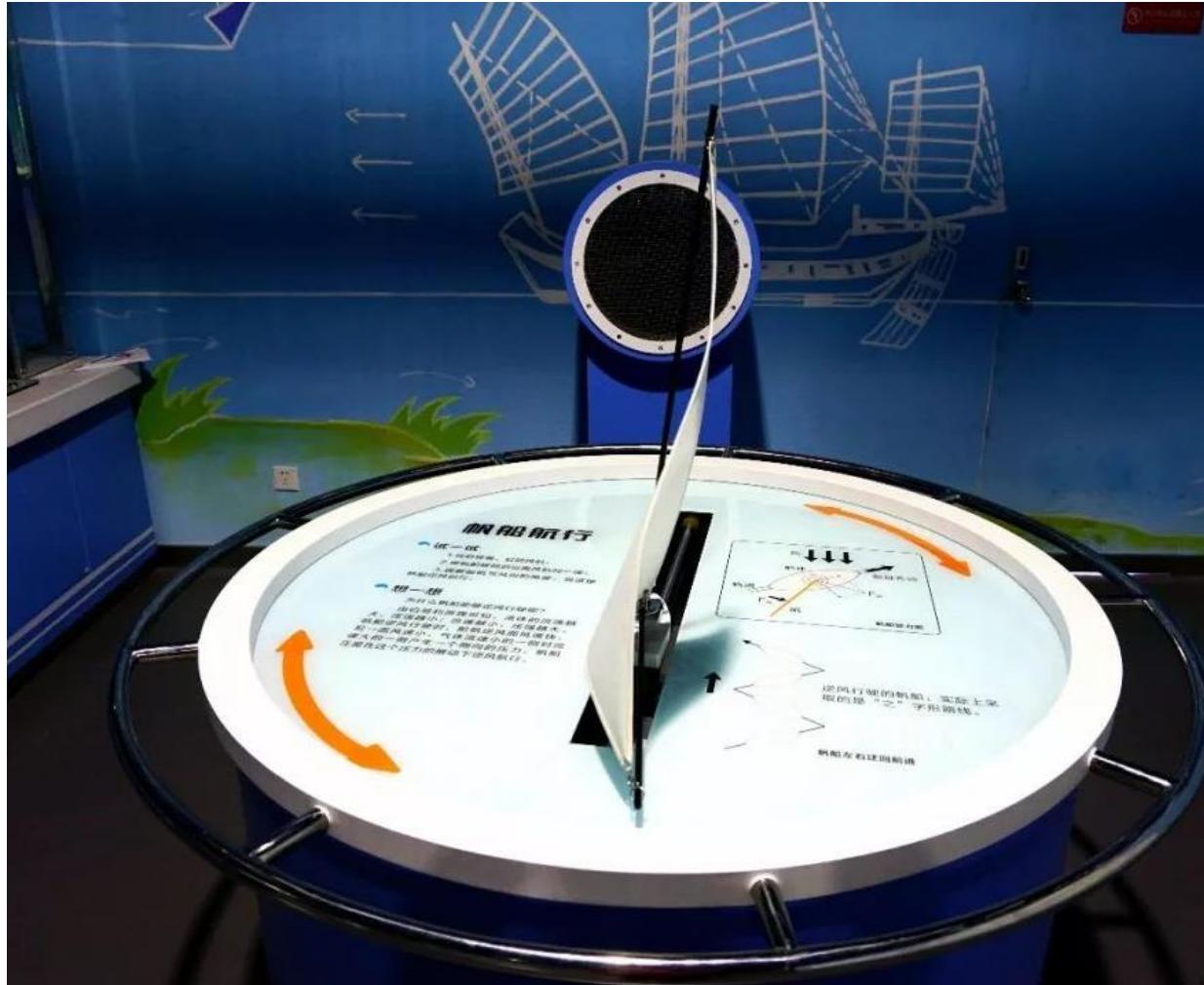


A screenshot of a YouTube video player showing a child experiencing a strong wind in a wind tunnel. The video player interface includes a back/forward button, a home icon, a lock icon, a URL bar with the link <https://www.youtube.com/watch?v=BKk7wYAJCCc>, a search bar containing "wind science museum", a three-dot menu, the YouTube logo, and a close button.

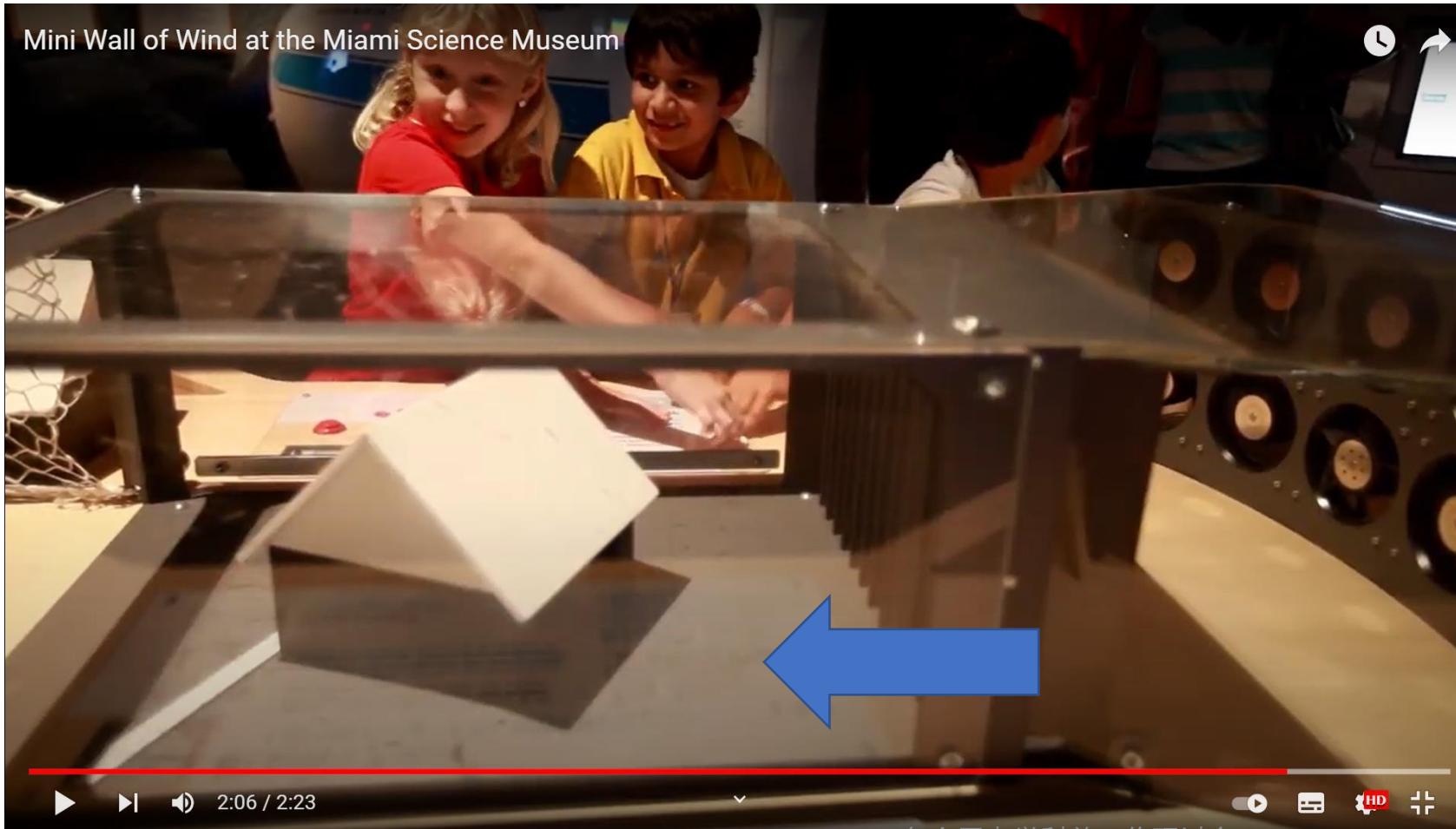
The video frame itself shows a young boy with his mouth wide open, looking shocked or excited. To his right, a person's arm and shoulder are visible. In the background, a digital display board shows the number "18.9 MPH". The bottom of the video player has a progress bar indicating the video is at 0:35 of 0:40, and control buttons for play/pause, volume, and full screen.

2021年全国力学科普工作研讨会
Wind Tunnel at Liberty Science Center!

力：逆风而上的帆船



力、压：强风与建筑物

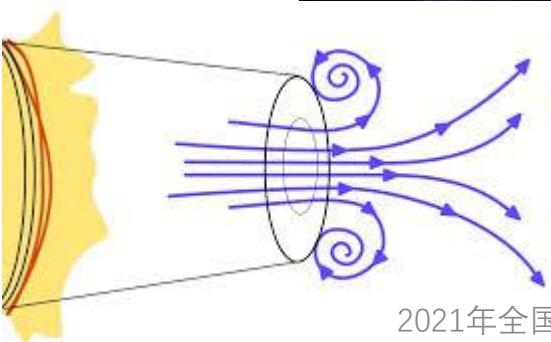


- [Mini Wall of Wind at the Miami Science Museum - YouTube](#)

迈阿密科技馆

旋涡：空气炮

关于旋涡的“开尔文定理”



2021年全国力学科普工作研讨会



旋涡：“自由涡”

关于旋涡的“开尔文定理”



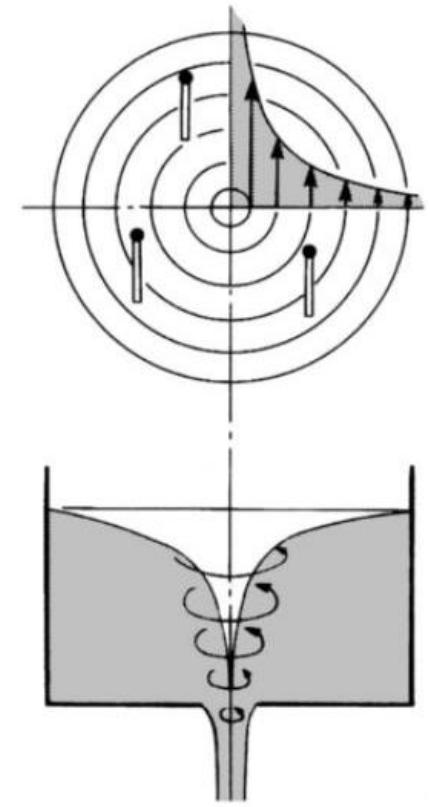
湖北荆门



天津

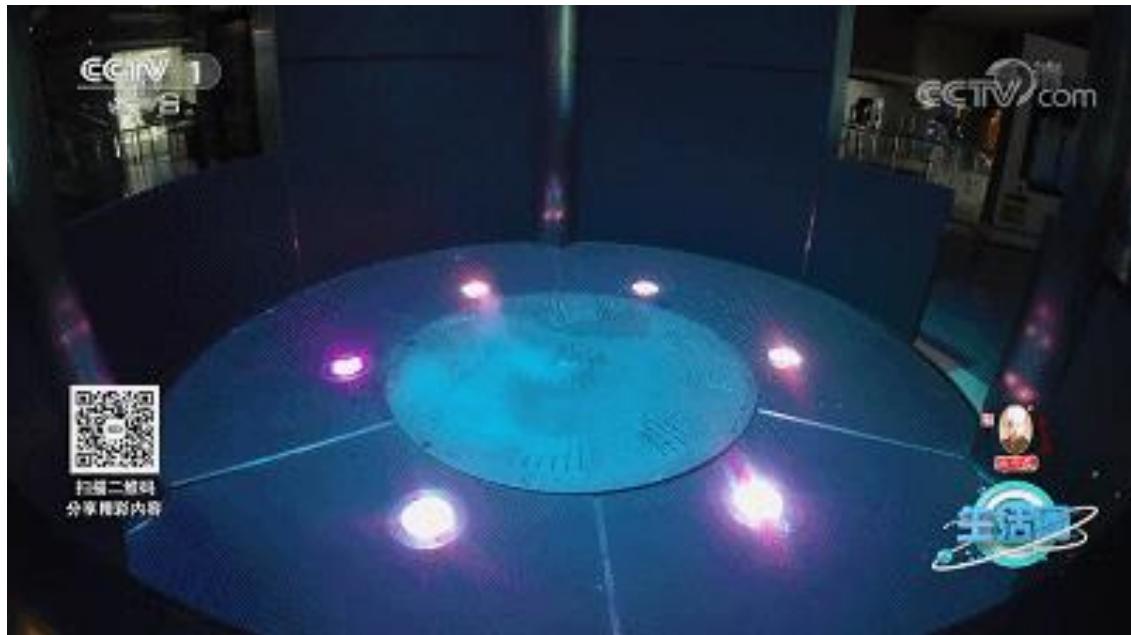


郑州气象科普馆



(b) Free vortex flow

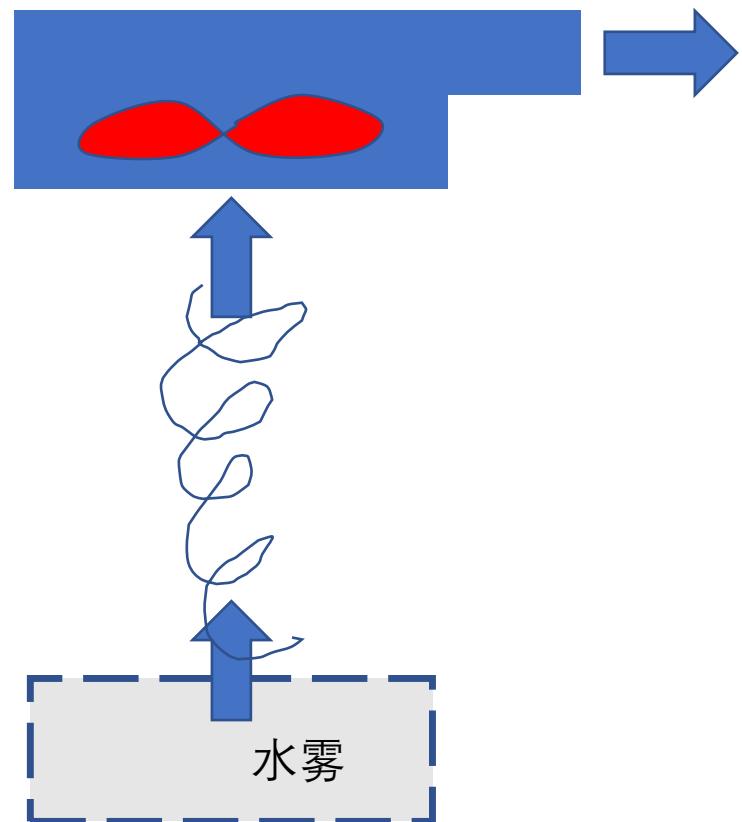
旋涡：自由涡（“龙卷风”）



辽宁科技馆

[科技馆说 | 龙卷风 \(qq.com\)](#)

2021年全国力学科普工作研讨会



让孩子去触摸

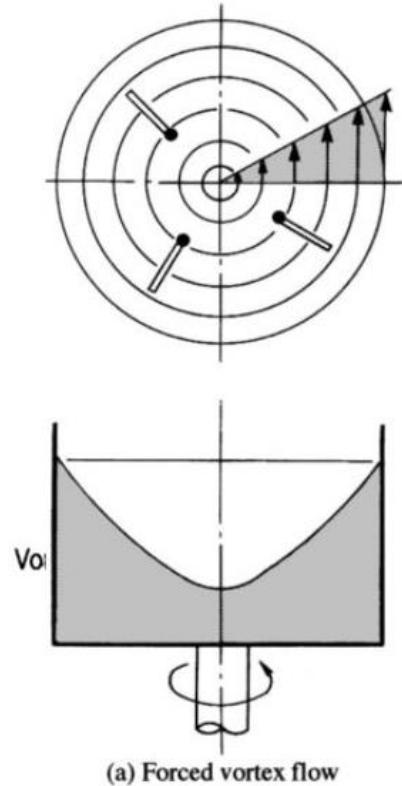
深圳宝安科技馆



- 新加坡



旋涡：“受迫涡”（转台）



天津科技馆



泰州科技馆

2021/12/18



上海科技馆

2021年全国力学科普工作研讨会



许昌科技馆

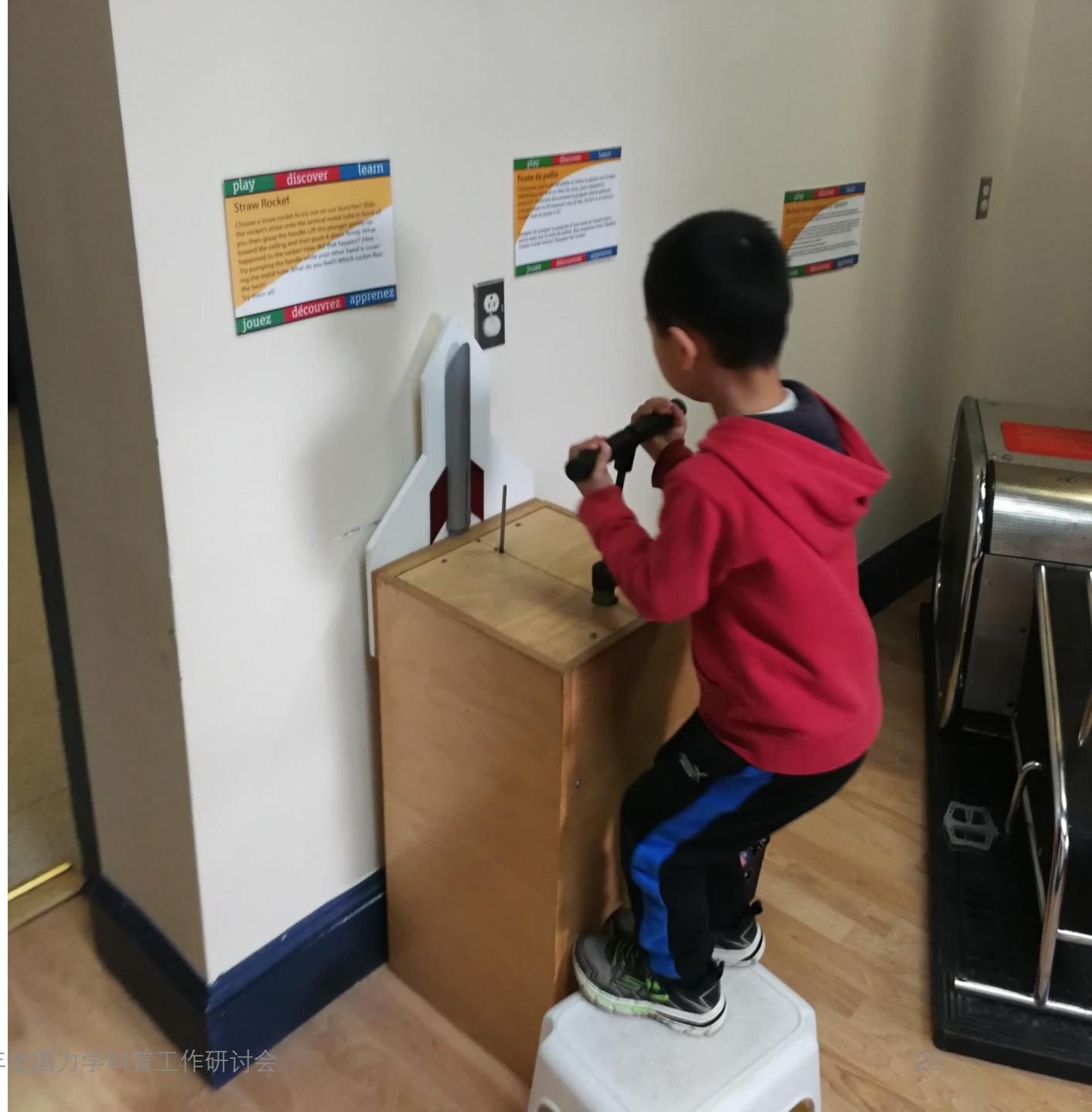
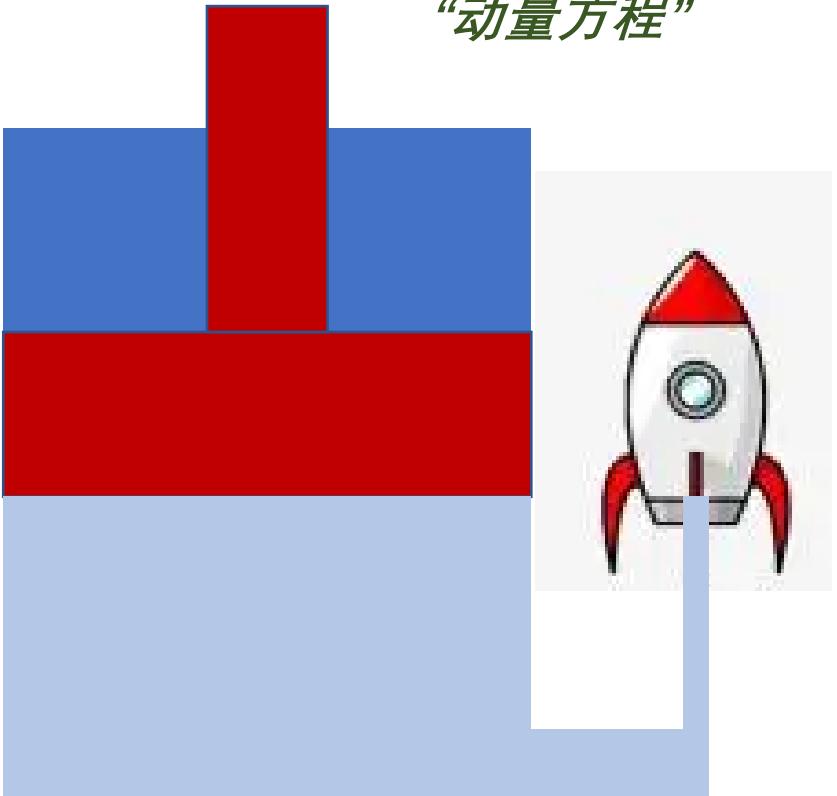


深圳科技馆

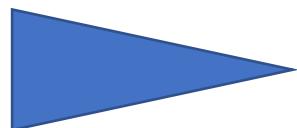
Shot on OPPO R11

火箭发射器

“连续性方程”
“动量方程”

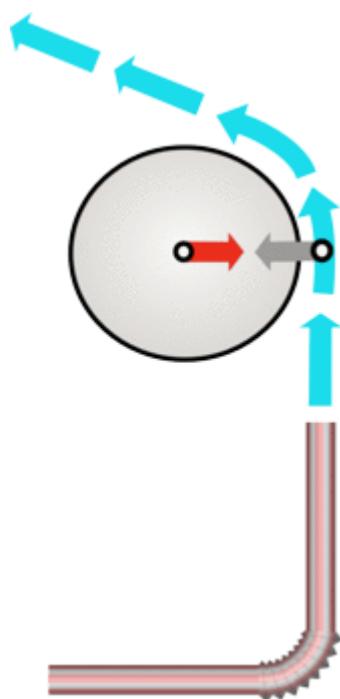


阻力



中国科技馆

欧拉方程：不掉的球



欧拉方程、
Coanda Effect、
伯努利方程

2021/12/18



黄石科技馆

2021年全国力学科普工作研讨会



Children's Museum Tucson/Oro Valley

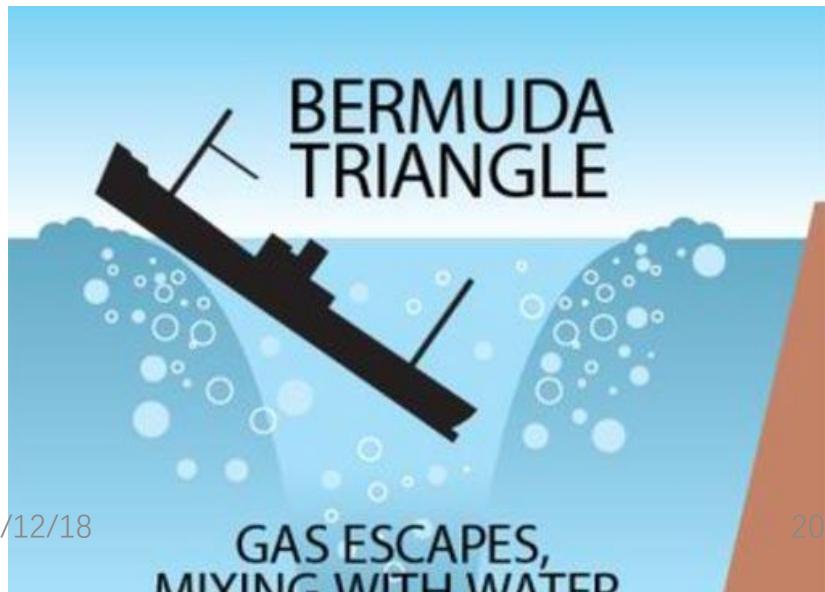
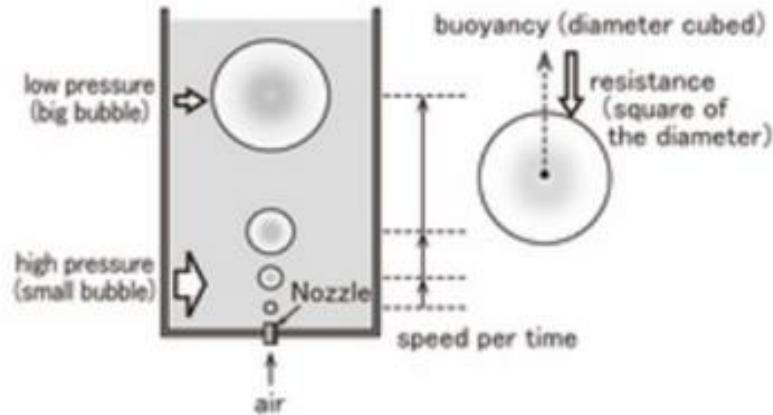
22

运动：

- 自由射流



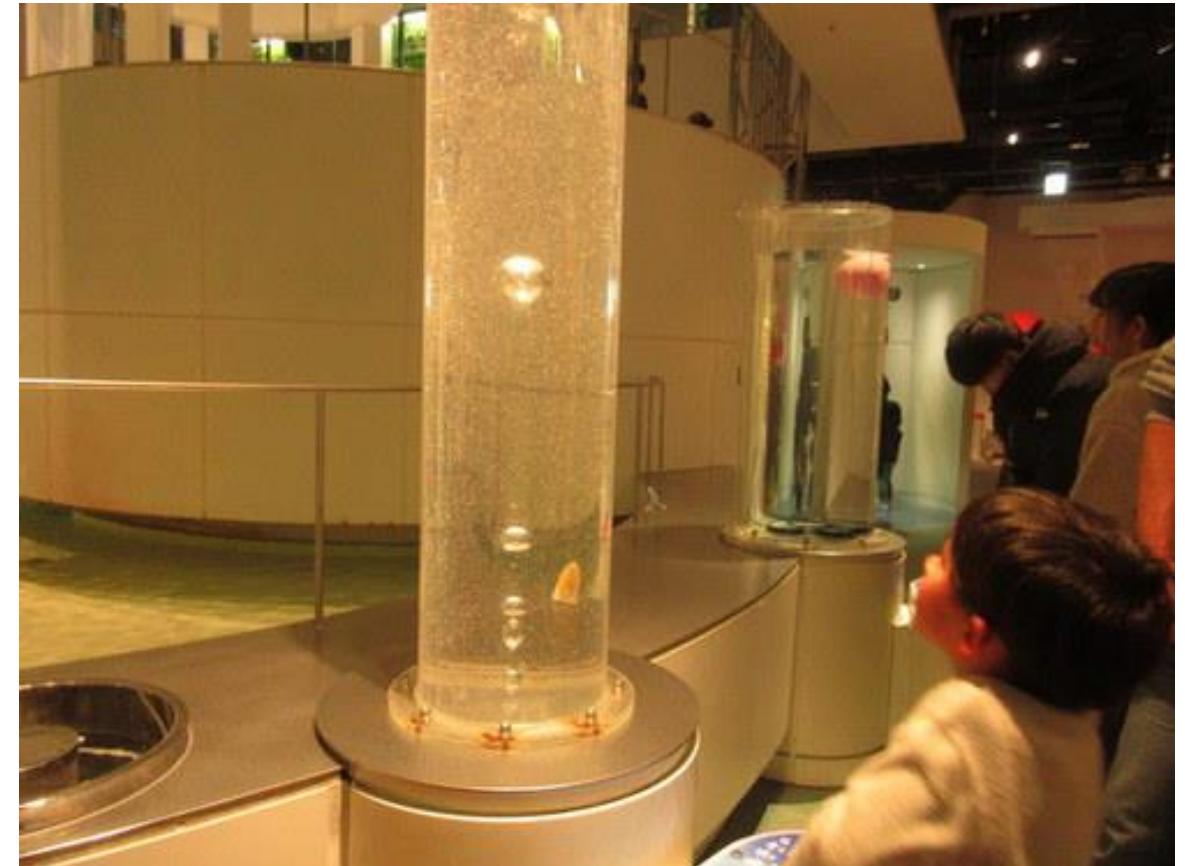
两相流



2021/12/18

GAS ESCAPES,
MIXING WITH WATER

2021年全国力学科普工作研讨会



名古屋

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水利



• 安大略科学中心



McConnell Science Museum



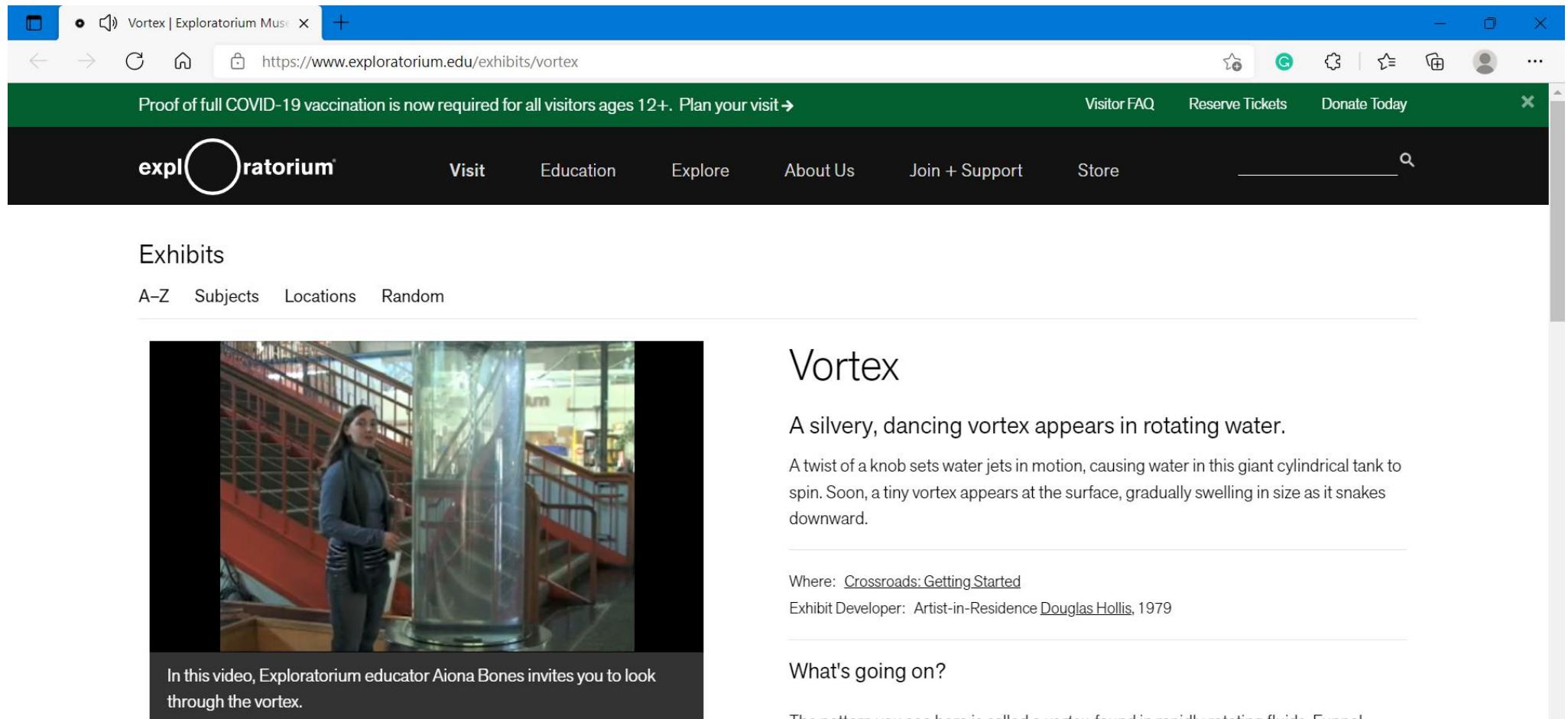
2021/12/18

2021年全国力学科普工作研讨会

肯塔基科学中心

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旋涡：线上科技馆



The screenshot shows a web browser window for the Exploratorium Museum's website. The title bar reads "Vortex | Exploratorium Muse". The address bar shows the URL "https://www.exploratorium.edu/exhibits/vortex". A green banner at the top states "Proof of full COVID-19 vaccination is now required for all visitors ages 12+. Plan your visit →". The main navigation menu includes "Visitor FAQ", "Reserve Tickets", "Donate Today", "Visit", "Education", "Explore", "About Us", "Join + Support", and "Store". The search bar is located on the right. Below the menu, the word "exploratorium" is written with a large circle around the letter "o". The page content starts with a section titled "Exhibits" with links for "A-Z", "Subjects", "Locations", and "Random". A video thumbnail shows a woman standing next to a large cylindrical tank filled with water. A caption below the video reads: "In this video, Exploratorium educator Aiona Bones invites you to look through the vortex." To the right, a large section is dedicated to the "Vortex" exhibit, featuring a title, a description, and details about its location and developer. There is also a "What's going on?" section with explanatory text.

Proof of full COVID-19 vaccination is now required for all visitors ages 12+. Plan your visit →

Visitor FAQ Reserve Tickets Donate Today

Visit Education Explore About Us Join + Support Store

exploratorium

Exhibits

A-Z Subjects Locations Random

In this video, Exploratorium educator Aiona Bones invites you to look through the vortex.

Vortex

A silvery, dancing vortex appears in rotating water.

A twist of a knob sets water jets in motion, causing water in this giant cylindrical tank to spin. Soon, a tiny vortex appears at the surface, gradually swelling in size as it snakes downward.

Where: [Crossroads: Getting Started](#)
Exhibit Developer: Artist-in-Residence [Douglas Hollis](#), 1979

What's going on?

The pattern you see here is called a *vortex*, found in rapidly rotating fluids. Funnel-shaped forms such as this occur in both liquids and gases. You make a vortex every time you stir your coffee, flush a toilet, or empty your bathtub. Tornadoes, waterspouts, and dust devils are also vortices.

旋涡：线上科技馆

YouTube MY 搜索



Science Storms—How It Works: Vortex
1,203次观看 · 2020年10月23日

19 踩 分享 保存 ...

2021/12/Museum of Science and Industry, Chicago 9070位订阅者

2021年全国力学科普工作研讨会 已订阅

老外：幸好没相信外媒，走在真实的西藏拉萨街头让我颠覆想象
Luca&Rachele 路卡和瑞丽
22万次观看 · 1个月前

What does a Gong Sound Like when Hit with a 1189mph...
SmarterEveryDay ✓
291万次观看 · 5天前
最新

Special Lecture: F-22 Flight Controls
MIT OpenCourseWare
208万次观看 · 10个月前

Most Useless Megaprojects in the World
Top Luxury ✓
2524万次观看 · 4周前

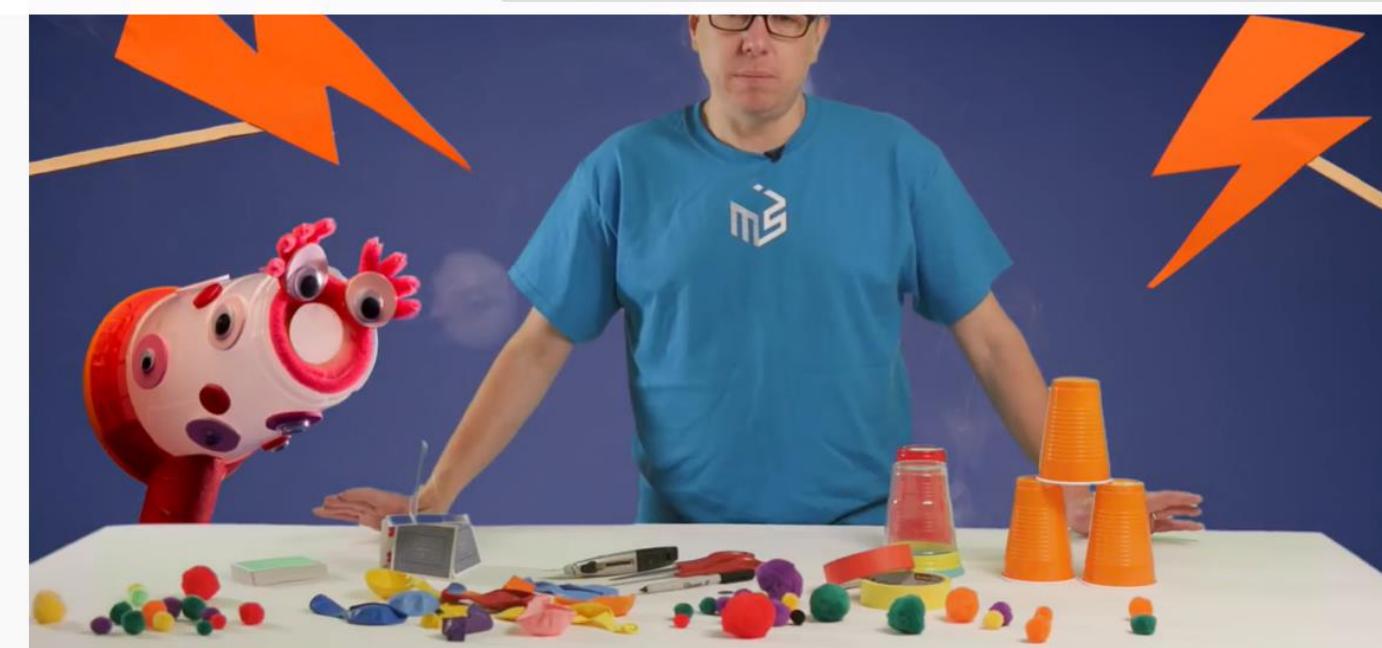
Explaining Veritasium Electricity Video: Energy doesn't flow in...
Robert Feranec
5万次观看 · 2周前

"Science and the taboo of psi" with Dean Radin

28

线上组织孩子们动手、竞赛

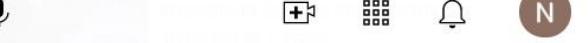
2021/12/18



Summer Brain Games 2017: Air Cannon
448次观看 · 2017年6月29日









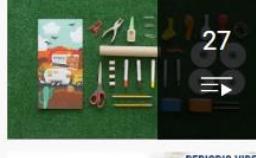
Xi Jinping and China's Role in a Shifting World - Live Stream
KAS Media Programme Asia
1.3万次观看 · 直播时间: 2周前



Iguana vs Snakes (Full Clip) | Planet Earth II | BBC Earth
BBC Earth
1367万次观看 · 6个月前



Are Animals Capable Of Feeling Complex Emotions? | Animal... | Animal Adventures
Animal Adventures
886万次观看 · 2年前



Summer Brain Games
Museum of Science and Industry, Ch...



Nipponium - The Element that Wasn't - Periodic Table of...
Periodic Videos
5.5万次观看 · 12小时前
最新



I walked from one side of Beijing to the other...
Blondie in China
29

Museum of Science and Industry, Chicago
9070位订阅者

已订阅

2021年全国力学科普工作研讨会

Control the wind! Create a balloon-powered cannon that blasts a stream of air powerful enough to

总结

- 展馆科普项目有很大的需求
- 设计新的展馆科普项目要突出“**玩**”
- 展品要有
 - 趣味性
 - 与生活相关
 - 可现场操作
 - 直观性
 - 流动显示
 - 科学性
 - 目标不是教原理，而是赋予少年儿童直观印象
 - 覆盖科学原理
- 线上科技馆