科技馆流体力学展品调研

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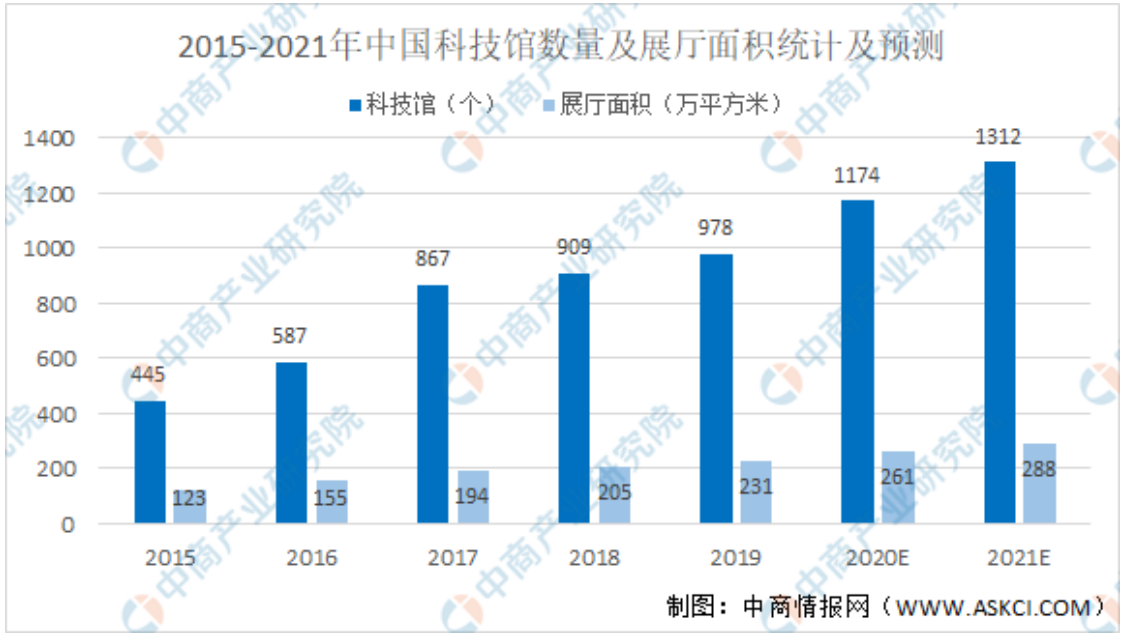
背景

- 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

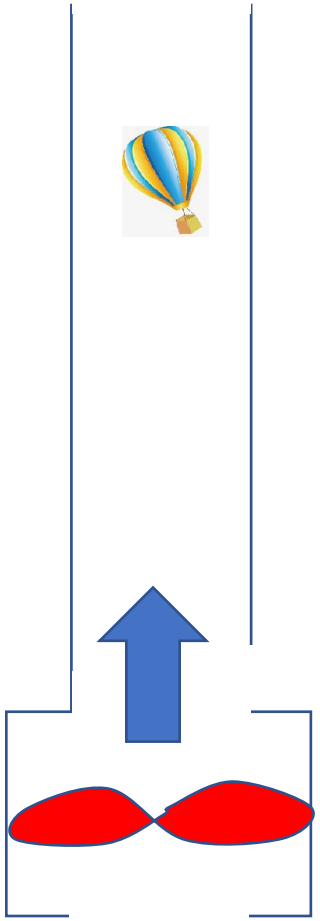
放飞自我,绵阳科技馆娱乐风洞等你来high

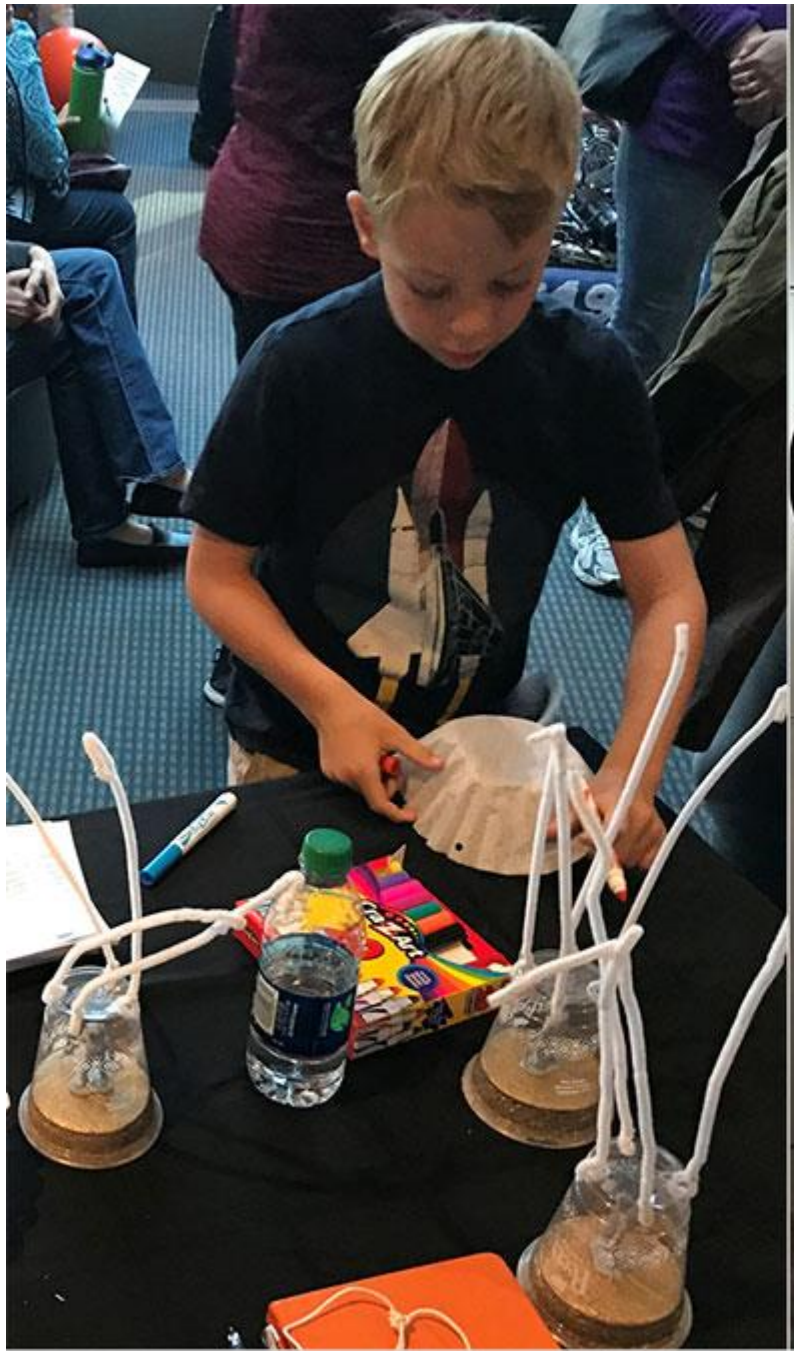
低速风洞

- 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

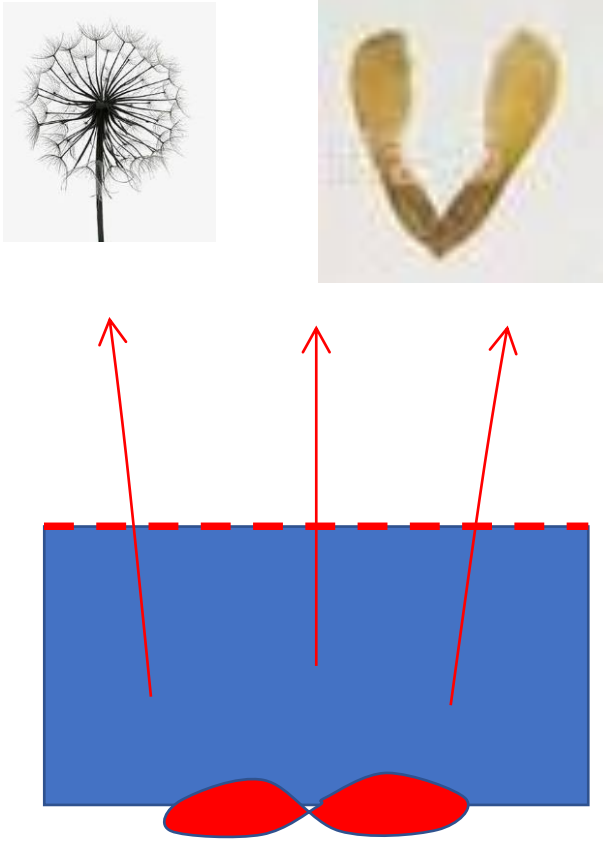
Fluid Dynamics - Carnegie Science Center





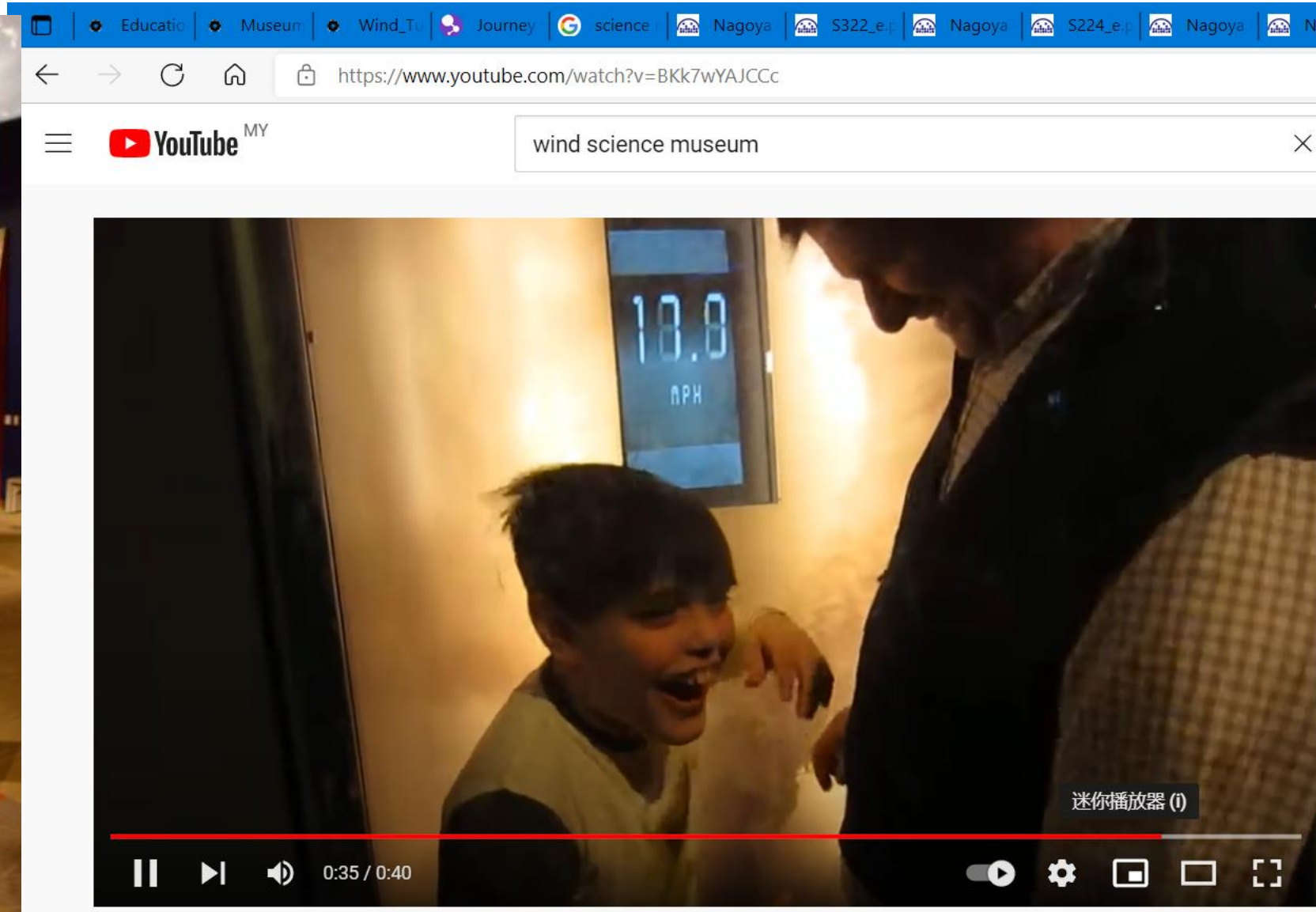
Quest Science Center

力：竖直风洞



Fluid Dynamics - Carnegie Science Cent

力、压：旋风箱



Wind Tunnel at Liberty Science Center!

力：逆风而上的帆船

安徽科技馆

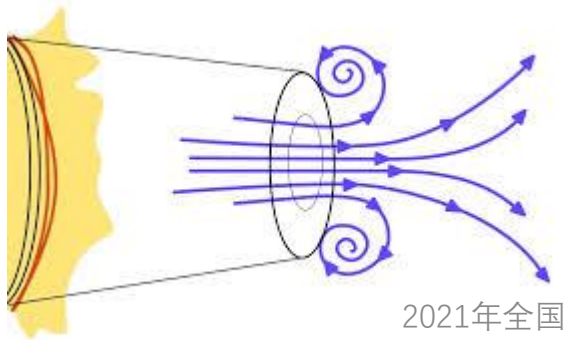
力、压：强风与建筑物

- 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”



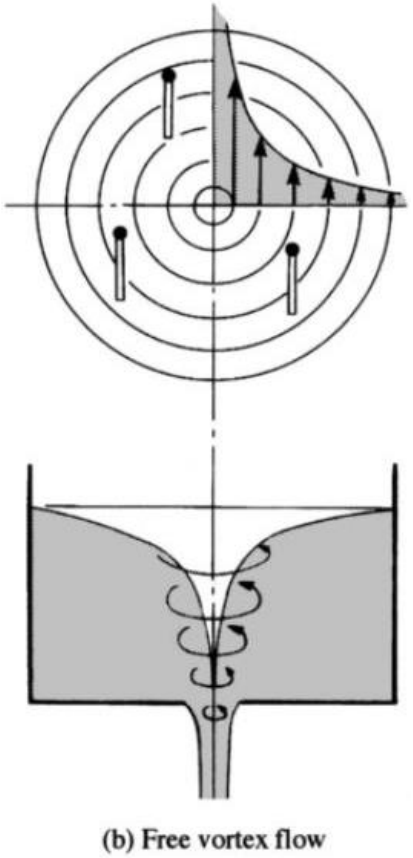
旋涡：“自由涡”

关于旋涡的“开尔文定理”

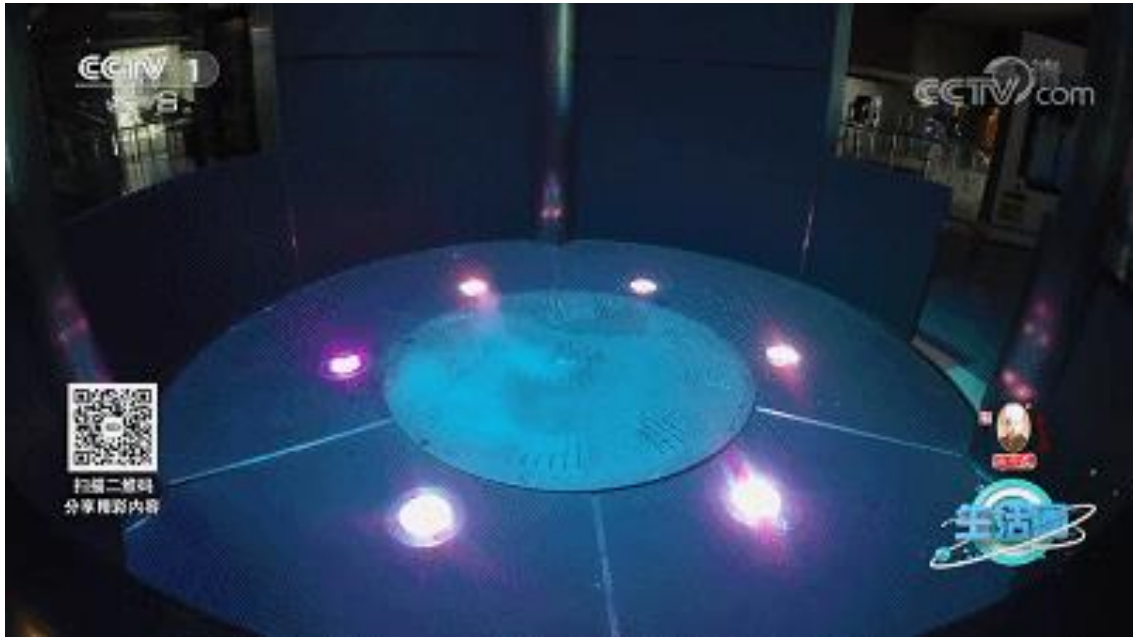
湖北荆门

天津

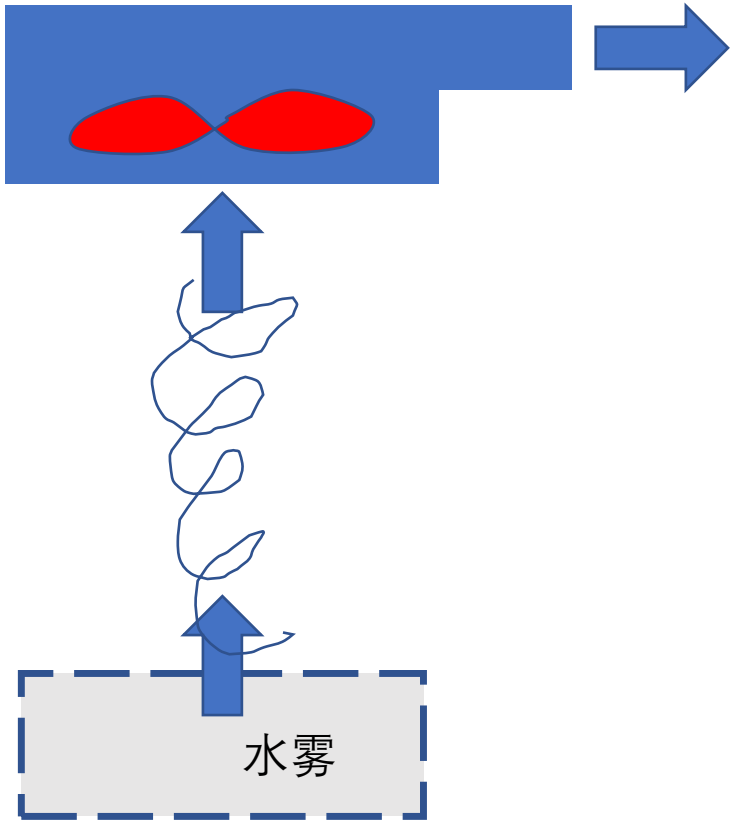
郑州气象科普馆



旋涡：自由涡（“龙卷风”）



辽宁科技馆



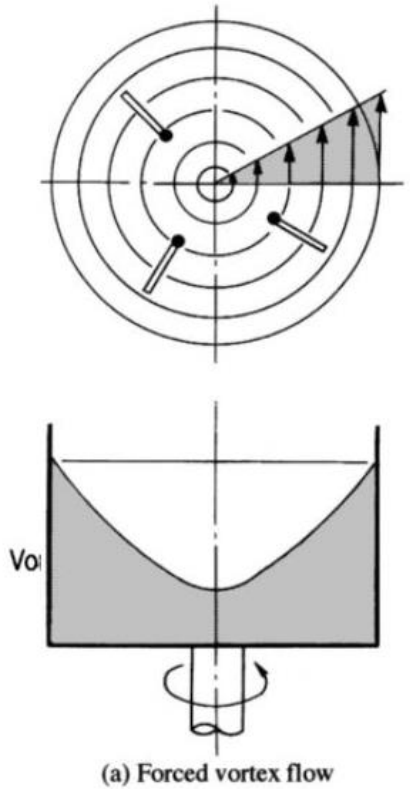
科技馆说｜龙卷风 (qq.com)

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

许昌科技馆

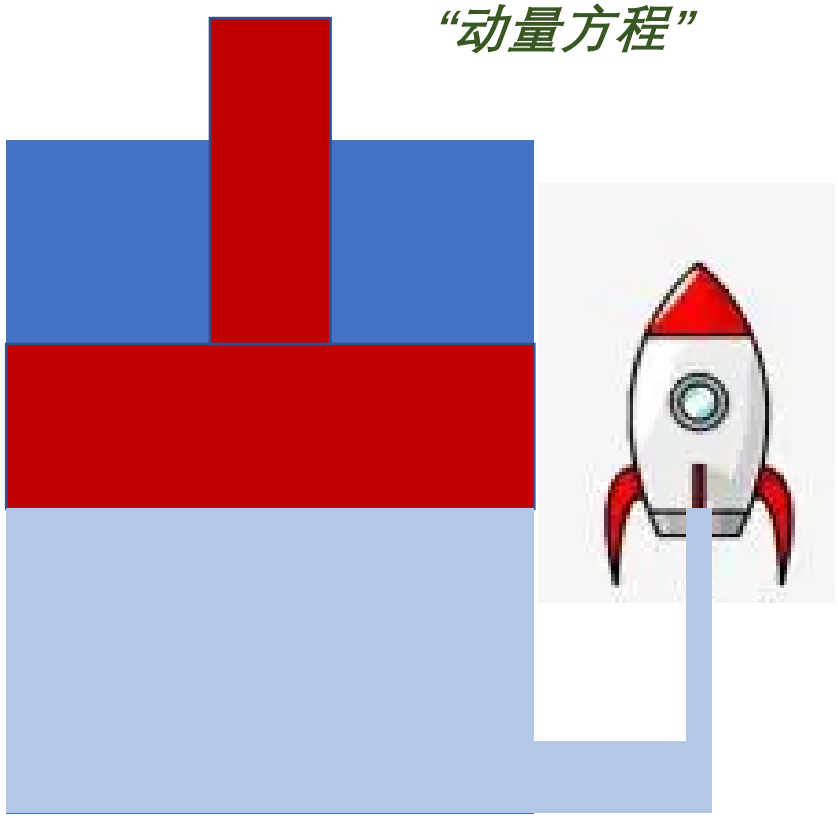
泰州科技馆

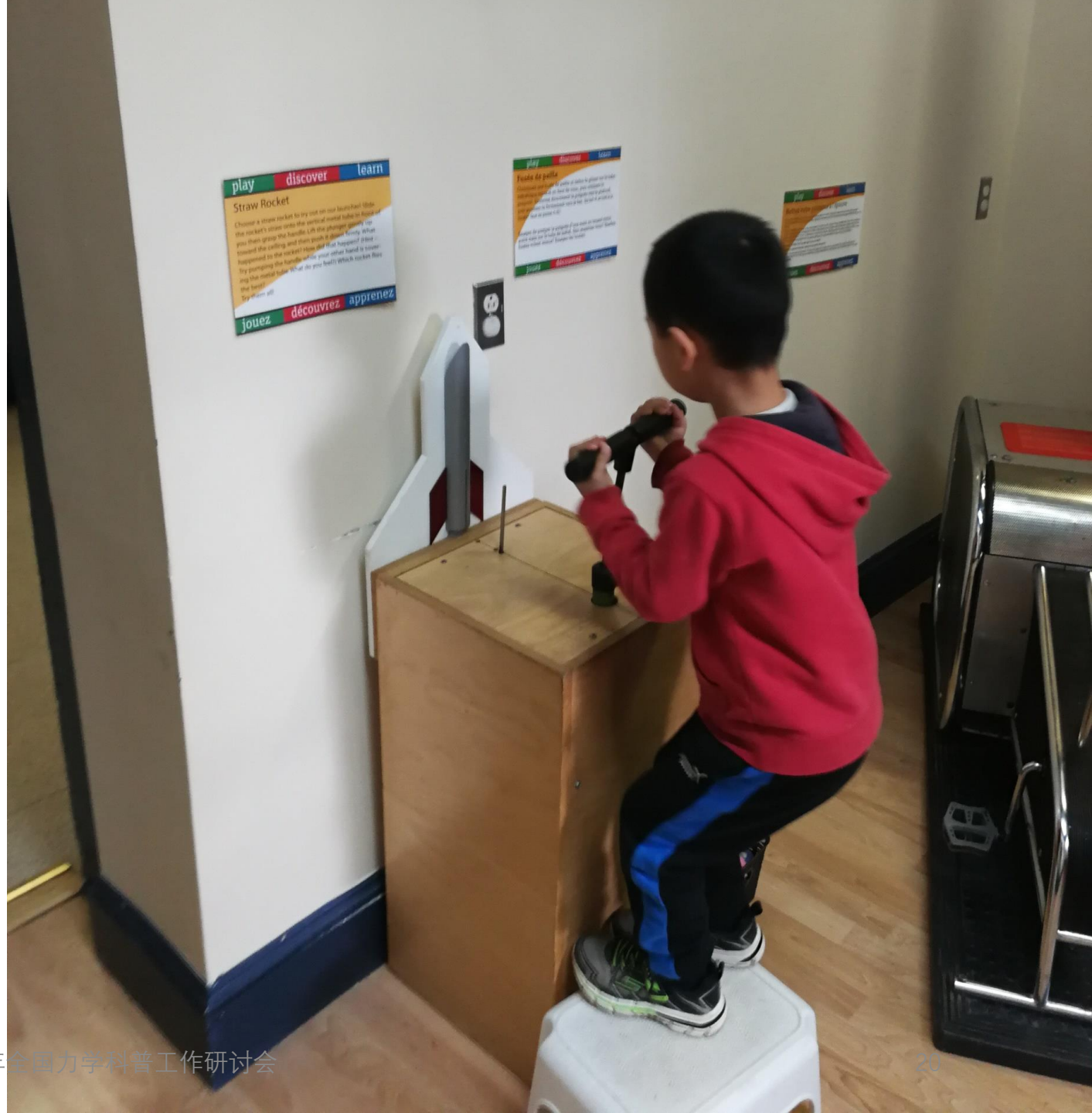
上海科技馆

深圳科技馆

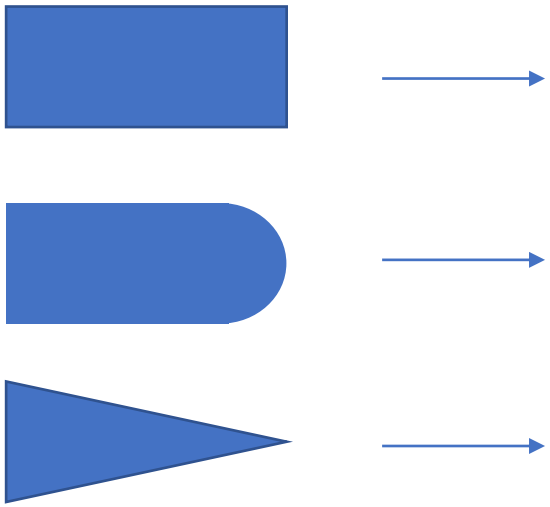
火箭发射器

“连续性方程”
“动量方程”



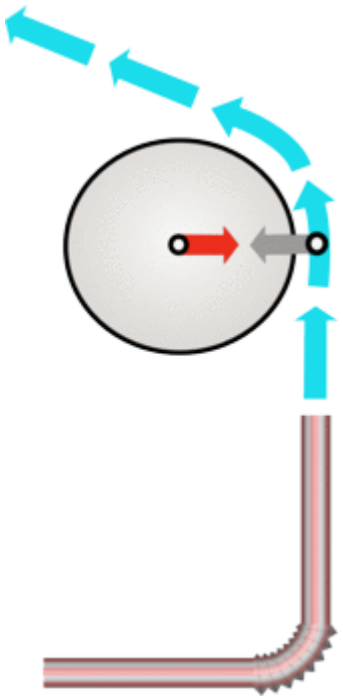


阻力

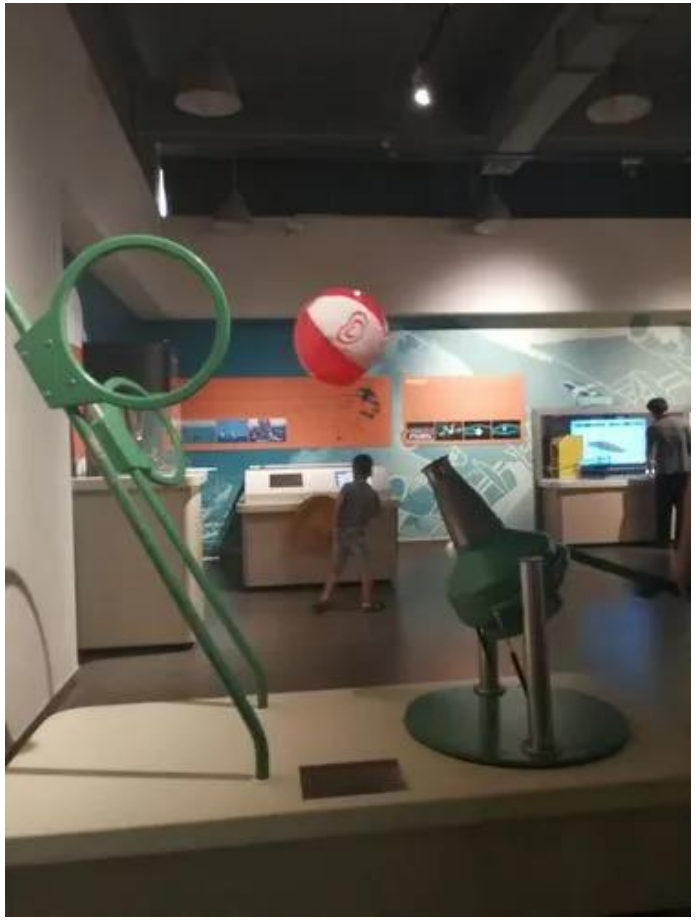


中国科技馆

欧拉方程：不掉的球



欧拉方程、
Coanda Effect、
伯努利方程



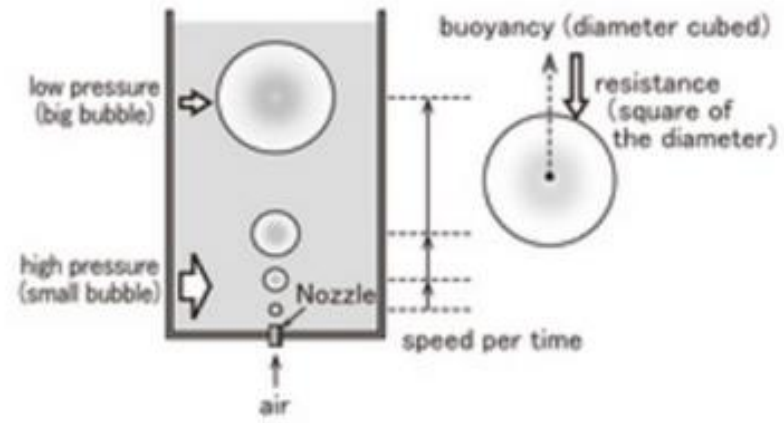
黄石科技馆

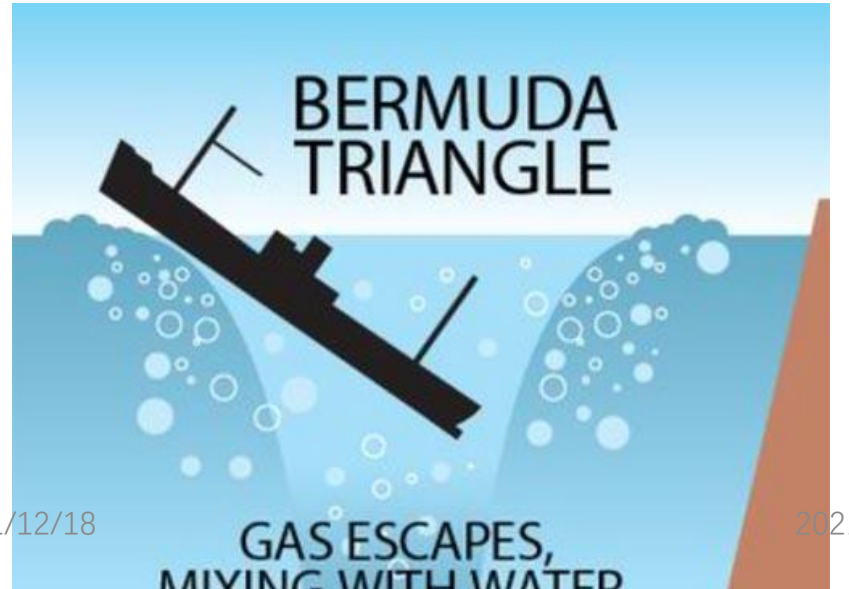
Children's Museum Tucson/Oro Valley

运动：

- 自由射流

两相流


buoyancy (diameter cubed)
resistance
(square of
the diameter)
low pressure
(big bubble)
high pressure
(small bubble)
Nozzle
speed per time
air


BERMUDA
TRIANGLE
GAS ESCAPES,

名古屋

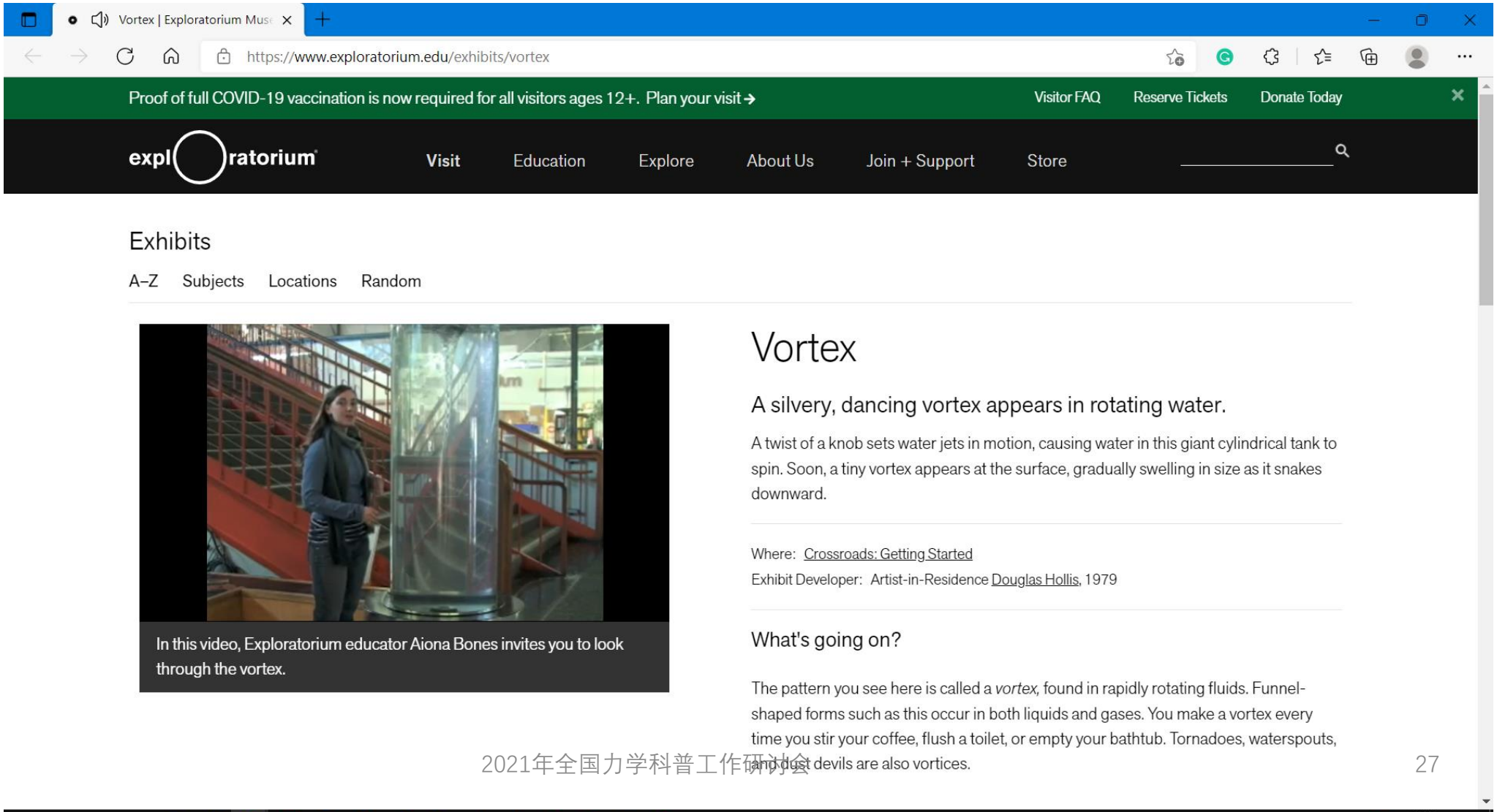
水利

- 安大略科学中心

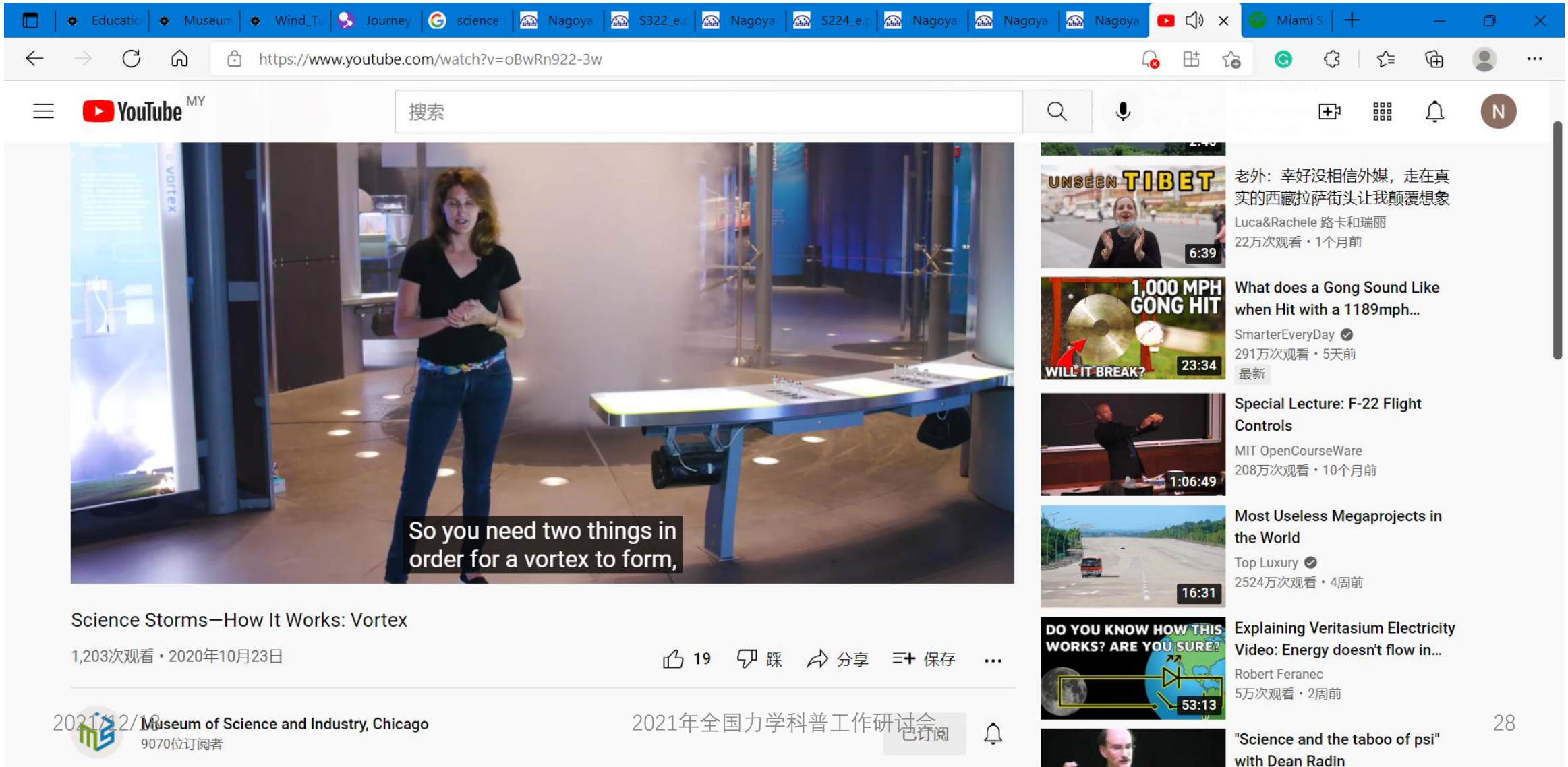
McConnell Science Museum

肯塔基科学中心

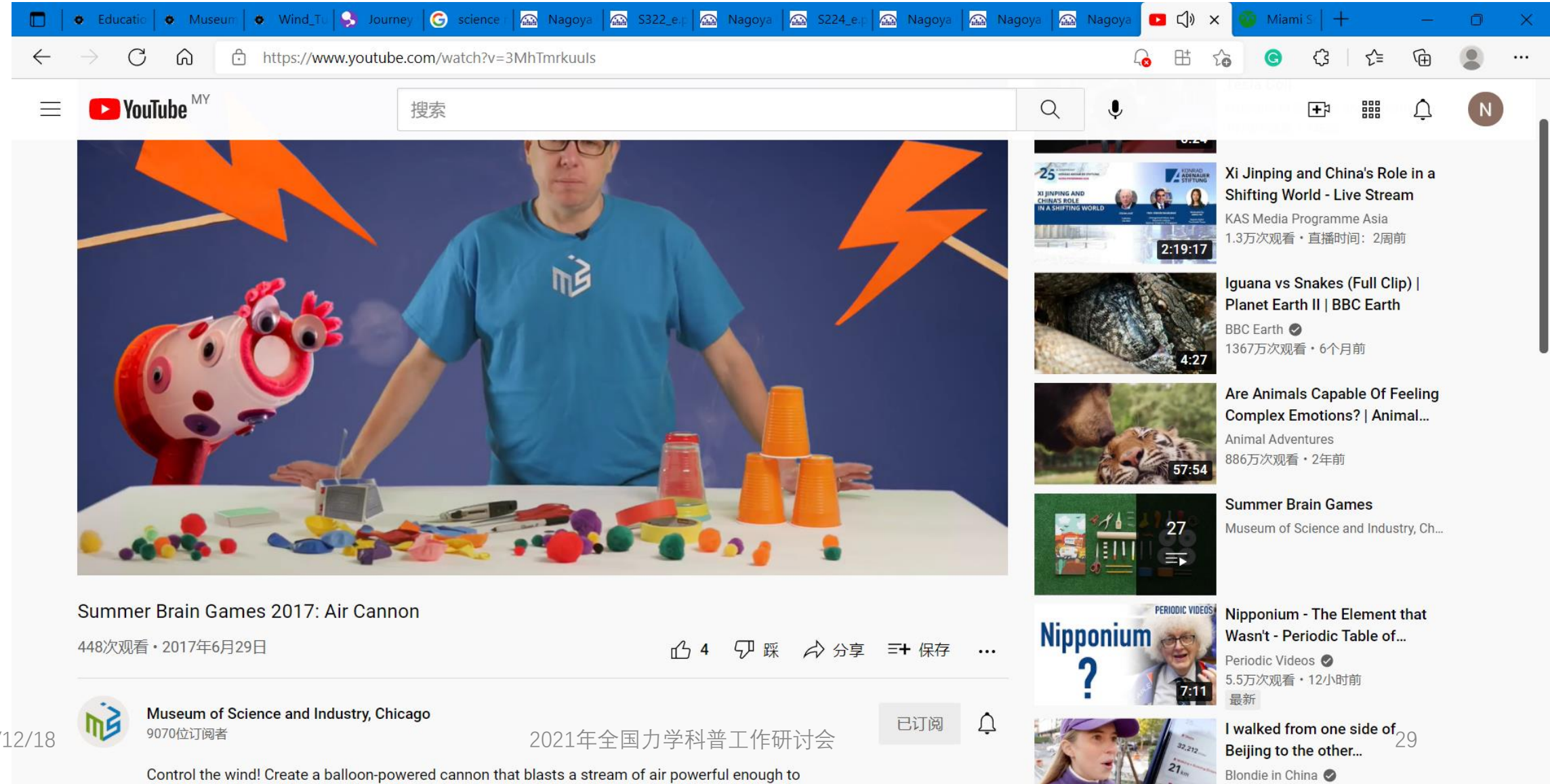
旋涡：线上科技馆


Vortex | Exploratorium Mus
https://www.exploratorium.edu/exhibits/vortex
Proof of full COVID-19 vaccination is now required for all visitors ages 12+. Plan your visit →
Visitor FAQ
Reserve Tickets
Donate Today
exploratorium
Visit
Education
Explore
About Us
Join + Support
Store
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


https://www.youtube.com/watch?v=oBwRn922-3w
YouTube MY
搜索
So you need two things in order for a vortex to form,
Science Storms—How It Works: Vortex
1,203次观看 • 2020年10月23日
19
踩
分享
保存
Museum of Science and Industry, Chicago
9070位订阅者
已订阅
UNSEEN TIBET
6:39
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
1,000 MPH GONG HIT
WILL IT BREAK?
23:34
What does a Gong Sound Like when Hit with a 1189mph...
SmarterEveryDay
291万次观看 • 5天前
最新
1:06:49
Special Lecture: F-22 Flight Controls
MIT OpenCourseWare
208万次观看 • 10个月前
16:31
Most Useless Megaprojects in the World
Top Luxury
2524万次观看 • 4周前
DO YOU KNOW HOW THIS WORKS? ARE YOU SURE?
53:13
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

线上组织孩子们动手、竞赛



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