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特别策划 SPECIAL FEATURE

## 民艺研究

FOLK ART RESEARCH

剪瓷雕工艺起源考辨

Examining Origin of the Porcelain Carving

施洞苗族母花纹样的生成与转化研究

Research on the Generation and Transformation of Miao Model Pattern in Shidong

闽南布袋戏的银幕化衍变

——83版大型彩色木偶电影《八仙过海》

The Evolution of Minnan Puppet Show on Screen:  
1983 Edition of Large - Scale Color Puppet Film  
*Eight Immortals Crossing the Sea*

云南鹤庆木纹金工艺流变研究

Study on Transition of Mokumegane  
in Heqing, Yunnan Province



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## 目录 CONTENTS

### 信息时空

栏目主持: 李拓 张明

短讯、要闻

005 Briefing, News

域外传真

008 Overseas Information

新设计

010 New Design

推荐阅读

011 Recommended Reading

### 特别策划: 民艺研究

栏目主持: 赵毅平

剪瓷雕工艺起源考辨

012 Examining Origin of the Porcelain Carving

郭希彦

Guo Xiyan

施洞苗族母花纹样的生成与转化研究

018 Research on the Generation and Transformation of Miao Model Pattern

谭晓宁 徐东升

in Shidong Tan Xiaoning Xu Dongsheng

闽南布袋戏的银幕化衍变

025 The Evolution of Minnan Puppet Show on Screen: 1983 Edition of Large-

——83 版大型彩色木偶电影《八仙过海》

scale Color Puppet Film *Eight Immortals Crossing the Sea*

项建恒

Xiang Jianheng

云南鹤庆木纹金工艺流变研究

032 Study on Transition of Mokumegane in Heqing, Yunnan Province

孙秋爽 王晓昕

Sun Qiushuang Wang Xiaoxin

### 特别关注

栏目主持: 李拓

2023 人工智能与设计创新论坛暨《装饰》杂志与美国《莱昂纳多》杂志合作特刊发布会在京举办

2023 AI+Design Innovation Forum & *Zhuangshi* Journal and *Leonardo* Journal Cooperation Special Issue Setting Ceremony

编辑整理: 李拓 杜凡怡

Edited by Li Tuo Du Fanyi

### 纸上展览

栏目主持: 赵华

作为“文化图式”的体育视觉: 社会·公众·文化——国际体育视觉设计展

042 Sports Vision as a "Cultural Schema": Society, Public, Culture, the International Sports Visual Design Exhibition

张春艳 蔡仕伟 刘一蓝

Zhang Chunyan Cai Shiwei Liu Yilan

### 第一线

栏目主持: 萧冯

生计·生活·生命:

055 Livelihood, Life, and Lives:

朱小杰的设计哲学与实践

Xiaojie Zhu's Design Philosophy and Practice

李江 周志

Li Jiang Zhou Zhi

### News and Events

Column Host: Li Tuo Zhang Ming

### Special Feature: Folk Art Research

Column Host: Zhao Yiping

### Special Focus

Column Host: Li Tuo

### Exhibition on Paper

Column Host: Zhao Hua

### Front Line

Column Host: Xiao Feng

海外动向 栏目主持：李 拓

International Scholars  
Column Host: Li Tuo

创意孵化器：重新构想的教育  
[美] 戴安娜·艾顿·辛克  
翻译：汪芸

062 Reimagine Education as a Creativity Incubator  
Diana Ayton Shenker  
Translated by Wang Yun

史论空间 栏目主持：周 志

History of Art & Design  
Column Host: Zhou Zhi

V&A 的陶瓷楼梯：  
南肯辛顿设计教育体系的展示  
黄 虹 李银广  
晚明止园入园空间设计分析  
——曲径通幽入园模式的常规与变体  
张梓墨 刘珊珊 黄 晓  
酒盏旋将荷叶当  
——小议南宋史绳祖墓玉荷叶杯  
陈彦姝

072 The Ceramic Staircase in V&A: A Showcase of South Kensington's Design Education System  
Huang Hong Li Yinguang  
078 Analysis of the Design of the Entry Space in the Late Ming Zhi Garden: A Discussion on the Convention and Variants of Winding Road and Secluded Path Mode of Entry Zhang Zimo Liu Shanshan Huang Xiao  
084 Interpretation of Jade Cup in the Shape of a Lotus Leaf  
Chen Yanshu

民俗民艺 栏目主持：赵毅平

Folk Art and Culture  
Column Host: Zhao Yiping

形象在场与主题出场：  
江南刺绣“和合二仙”纹样研究  
梁惠娥 靳 璨  
场域变化与身份期待：  
广西陶瓷工匠群体的现代转型  
吴昊宇

090 Image Presence and Theme Appearance: Study on the Pattern of "He-He Gods" in Jiangnan Embroidery  
Liang Hui'e Jin Can  
096 Environmental Changes and Identity Expectations: Study on the Modern Transformation of Guangxi Ceramic Craftsmen  
Wu Haoyu

设计实践 栏目主持：田 君

Practice Column Host: Tian Jun

限塑背景下“免胶式”快递包装设计研究与实践  
柯胜海 张艺琳 杨志军

100 Research and Practice on the Design of "Non Adhesive" Express Packaging Under the Background of Plastic Restriction  
Ke Shenghai Zhang Yilin Yang Zhijun

教学档案 栏目主持：王小茉

Teaching Archives  
Column Host: Wang Xiaomo

设计服务劳育创新与实践研究  
——以南京理工大学设计教学项目为例  
徐 伟 姚坤雨 陈文露

106 Research on the Design Service, Labor Education Innovation and Practice: Taking the Design Teaching Project of Nanjing University of Science & Technology as an Example  
Xu Wei Yao Kunyu Chen Wenlu

## 个案点击

栏目主持：贾 珊

社会结构视角下的城市社区便民服务设计研究  
——以香港“绿在区区”社区回收服务为例

杨 煊

文化生态融合下的生态教育业态共创设计研究：  
以 Eden Project 为例

尤立思 孟 晗 赵云彦 刘 翔 文航轩 季 铁

## Case Study

Column Host: Jia Shan

111 Research on the Convenience Service Design of Urban Community  
from the Perspective of Social Structure: Taking Hong Kong's "GREEN@  
COMMUNITY" Community Recycling Service as an Example Yang Huan

117 Research on the Design of Value Co-creation System Under the  
Integration of Culture and Ecology: Taking Eden Project as an Example  
You Lisi Meng Han Zhao Yunyan Liu Xiang Wen Hangxuan Ji Tie

## 院校风采

栏目主持：赵 华 周 志

基于图式融合的传统民居改造设计研究  
——以凤凰客栈为例

王效康 韦宜佑

基于叙事图景的瑶族节庆可视化设计策略

徐 皎 赵曼煜

基于空间图式的传统村落整体保护设计研究  
——以高椅村为例

朱 力 唐 粤

黔东南施洞苗族“接龙破丝绣”中的图像表演研究

胡献雯

红旅纪念馆探秘文创设计的在场构建

——以《五十号档案》互动解谜书为例

徐 鸣 马晓昱

信息时代展陈空间“叠扇图式”设计研究

张 旒

中南大学教师设计作品

## Colleges

Column Host: Zhao Hua Zhou Zhi

124 Research on Residential Renovation Design Based on Schema  
Integration: Taking Phoenix Inn as an Example

Wang Xiaokang Wei Yiyou

128 Visual Design Strategy for Narrative Scenery of Yao Ethnic Festivals  
Based on Narrative Scenes Xu Jiao Zhao Manyu

132 Research on the Comprehensive Protection Design of Traditional Villages  
Based on Spatial Schema: A Case Study of Gaoyi Village

Zhu Li Tang Yue

136 Study on the Image Performance in the "Jielong Broken Silk Embroidery"  
of the Hmong in Shidong, Southeast of Guizhou Hu Xianwen

139 The Construction of the Presence of Cultural Creative Design of  
Decryption Type of Red Tourism Memorials: Taking the Interactive Puzzle  
Book *The Fiftieth File* as an Example Xu Ming Ma Xiaoyu

142 Research on the "Folding Fan Schema" of Exhibition Spatial Design in  
the Information Age Zhang Ni

封三 Teachers' Design Works from Central South University

# 创意孵化器：重新构想的教育

Reimagine Education as a Creativity Incubator

[美] 戴安娜·艾顿·辛克

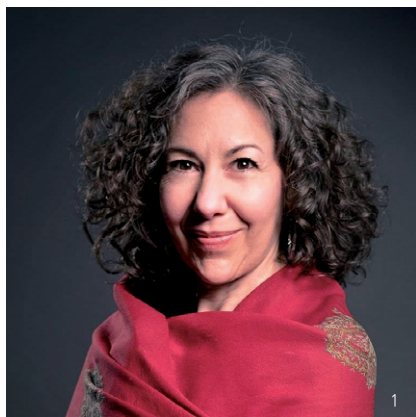
Diana Ayton Shenker

翻译：汪芸

Translated by Wang Yun

## 编者按：

戴安娜·艾顿·辛克是《莱昂纳多》杂志 / ISAST (International Society of Art, Science and Technology, 国际艺术、科学、技术协会) 的首席执行官；亚利桑那州立大学——《莱昂纳多》倡议项目的执行董事；亚利桑那州立大学实践教授、资深全球未来学科学家、星际学者。她有4本著作，其中包括《新全球议程：国际社会的优先事项、实践与路径》一书 (*A New Global Agenda: Priorities, Practices, and Pathways of the International Community*, Rowman & Littlefield, 2018)。作为“快进基金”(Fast Forward Fund)的创始人和“全球动力”(Global Momenta)的首席执行官，戴安娜获得了比尔·克林顿总统的嘉奖，并被评为“改变世界的25位杰出女性之一”(25 Leading Women Changing the World)。在本文中，戴安娜以其个人的亲身经历作为案例，展开了对创造力以及行动价值的深入解析，探讨了“行动价值”罗盘的4个基本方向以及创造力的5项核心实践，其中包括创造性沉思、创造性批评、创造性协作、创造性沟通与创造性内容生成。



1. 戴安娜·艾顿·辛克

## 引言

合作伙伴关系是重要的路标，它在探索变革的十字路口提供了方位图和协作团体。在一个充满了活力且时而动荡的变革时代，我们比以往任何时候都更需要彼此。感谢清华大学美术学院《装饰》杂志社的同事以及合作伙伴，我很荣幸与大家分享我的一些想法和策略，旨在将教育重新构想为创造力的孵化器。为此，我将汲取从《莱昂纳多》、生活和爱当中学到的

戴安娜·艾顿·辛克，《莱昂纳多》/国际艺术、科学、技术协会首席执行官

汪芸，《装饰》海外记者

## INTRODUCTION

Collaborative partnerships serve as essential guideposts providing maps and fellowship to explore transformative crossroads. In an era of exuberant, at times turbulent, transformation, we need each other more than ever. With gratitude to my colleagues and associates at *Zhuangshi*, the Academy of Arts & Design, Tsinghua University, I am honored to share some of my thoughts and strategies designed to reimagine education as a Creativity Incubator. To do so, I will draw from a storehouse of personal experience and professional lessons learned with *Leonardo*, life, and love. <sup>[1]</sup> In recognition that all design tells a story, this essay begins and ends with two vignettes from my recent experience.

## THE BANKER, THE FIREFIGHTER, & THE ANARCHIST

I share my first story as backdrop to the work of reimaging education as a creativity incubator. This is a personal story that's taken me more than 10 years to be able to tell. It's a true story of how I survived and what lessons I learned from a 120-kilometers-per-hour, highway rollover car crash. I call this story, "The Banker, the Firefighter,

Diana Ayton Shenker, CEO of *Leonardo*/ISAST

Wang Yun, Oversea Correspondent of *ZHUANGSHI*



*The Ramp*, by Sara Hendren, Yevgenia Zastavker, and Olin College Students for Kinetic Light's Wheelchair-Dance Performance "Descent"  
Photo Credit: Mancc/Chris Cameron

2.《坡道》(*The Ramp*), 由萨拉·亨德伦 (Sara Hendren)、叶夫根尼娅·扎斯塔夫克 (Yevgenia Zastavker) 和奥林工程学院 (Olin College of Engineering) 的学生为“动能光” (Kinetic Light) 的轮椅舞蹈表演《下倾》(*Descent*) 创作, 图片来源: MANCC (玛吉·阿勒西国家编舞中心) / 克里斯·卡梅伦 (Chris Cameron)

个人经验与专业教训。<sup>[1]</sup> 因为认识到所有的设计都会讲述一个故事, 所以本文将在我最近经历中的两段小插曲作为开始和结束。

### 银行家、消防员和无政府主义者

在此分享我的第一个故事, 作为将教育重新构想为创造力孵化器的背景。这是我花了十多年才能讲述出来的一段个人经历。这是一个真实的故事, 讲述了我如何幸存下来, 以及我从一场时速 120 公里的高速公路侧翻车祸中吸取的教训。我把这个故事称为“银行家、消防员和无政府主义者”。

#### 第 1 个教训: 预见不可见的冰

故事开始的地点和时间看起来很像新英格兰明信片上的冬季场景。那是纽约州北部的深冬, 3 月初, 我在一条繁忙的高速公路上开车回家。路面上已没有了过去 3 个月覆盖该地区的积雪, 这是冰雪融化的时节。地面仍然冰冻寒冷, 但不再有任何可见的冰, 世界展现出我们每年春天都能经历的重生的希望。但不幸的是, 高速公路上仍然有一些看不见的冰。因此, 当我在晚上五点钟的高峰时段开车回家, 在挤满其他司机的高速公路上以每小时 120 公里的速度行驶的时候, 我的车轮意外地在冰上打滑。突然, 汽车开始不受控制地打滑, 以每小时 120 公里的速度横穿了两条车道。出乎意料的是, 在此期间, 我居然没有被任何其他车辆撞到, 而是径直冲向了一座水泥塔, 那是支撑头顶立交桥的水泥墙。在最后一刻, 我设法避免了正面碰撞, 因为汽车开始翻滚一次、两次, 然后多次, 最后落在高速公路边。不知何故, 在翻车过程中, 我再次避免了撞到另一辆车或是被另一辆车撞到。在最后的撞击中, 汽车没有停在路中央, 而是落在了路肩上, 摇摇欲坠地停在车的乘客一侧, 但安全地停在交通拥堵的路段之外。震惊之余, 我发现自己仍然坐在驾驶座上, 身上还系着救了我一命的安全带。

and the Anarchist.”

#### Lesson #1: Expect Invisible Ice

The story begins in a place and a time that looked a lot like a winter scene from a New England postcard. It was very late winter in upstate New York, and I was driving home in early March on a busy highway. Instead of the snow that had covered that part of world for the previous three months, it was the first day that the snow had melted. The ground was still frozen and cold, but there was no longer any ice visible and the world showed the promise of a rebirth that we get to experience each year in spring. But unfortunately, there was still some ice that remained invisible on the highway. So, as I drove home at five o'clock in the evening, in rush hour, at 120-kilometers-per-hour, on a highway full of other drivers, my wheels unexpectedly slid on some ice. Suddenly, the car started to skid uncontrollably, fishtailing across two lanes of traffic, at 120-kilometers-per-hour. Miraculously, I avoided hitting any other cars or being hit by another vehicle. I was headed straight for a cement pylon, the cement wall that upholds the overpass overhead. At the very last fraction of a second, I managed to escape that head-on collision because the car started to roll over once, and then twice, and then again, landing on the side of the highway. Somehow, in the rollover itself, again I avoided hitting or being hit by another car. And in its final impact, the car landed not in the middle of the road, rather on the shoulder of the road, precariously perched on the passenger side of the car, but safely outside the flow of heavy traffic. In shock, I found myself still in the driver's seat suspended by the seat belt that saved my life.

#### Lesson #2: Welcome Unexpected Partners

Immediately, I took that intuitive, instant self-scan. I knew I was okay. I unbuckled my seatbelt, and I stood on the passenger side door on top of the deployed airbags. I reached up to open the driver's door now like a hatch above me, and I waved my arm to indicate "I'm here! Help!" Without hesitating, I held on to the sides of that portal and I pulled myself up to the top of the car on its side. Before I could begin to navigate how I would descend from that precarious perch, I heard an unfamiliar voice that said, "I got you." I looked down, and there was a stranger who had stopped and rushed to the car. He lifted up his arms. And I looked down at him and I said, "you got me?" And he repeated, "I got you" . I put myself in his arms, and he carried me a safe distance from the car, which was now enveloped in a plume of smoke from the impact. He sat me down on the frozen ground beside the highway where we were joined at once by two other strangers who came to sit with us in the middle of rush hour, on that very cold evening, on their way home. But instead of continuing on their way home, they sat with me. They looked at the car, and they looked back at me, and they shook their heads. "I just don't know how this could be." One emergency vehicle came, and then another, and then another,

## 第 2 个教训：迎接意外的合作伙伴

我立即进行了直观、即时的自我审视。知道自己没事，我解开安全带，站在乘客侧车门上，安全气囊已打开。我伸手打开驾驶员一侧的车门，这就像是位于我上方的舱门。我挥动手臂示意，大呼：“我在这里！请帮助我！”我毫不犹豫地抓住了车门入口的两侧，然后把自己拉到了位于汽车侧面的顶部。就在我开始思考如何从那个不稳定的栖息地降落到地面之前，我听到一个陌生的声音说：“我抓住你了。”我低头一看，有一个陌生人停了下来，冲到了我的车上。他举起双臂。我低头看着他，说道：“你明白我的意思了吗？”他重复道：“我找到你了。”他用双臂接住了我，并把我带到与汽车有一段安全距离的地方。现在，我的车因为撞击而被一缕烟雾笼罩着。他帮助我坐在高速公路旁结冰的地面上，另外两个陌生人立刻加入了我们，他们在高峰时段，在那个非常寒冷的夜晚，在回家的途中和我们坐在一起——他们没有继续前行，而是选择和我坐在一起。他们看了看车，又看了看我，然后摇了摇头。“真不知道怎么会这样。”一辆救援车来了，接着又一辆，然后又是一辆，警察、州警、拖车、消防车都来了。每个来来往往的司机都一一重复着陌生人的回应：他们看看车，回头看看我，然后摇头。“真不知道怎么会这样。”最后，在近一个小时之后，一辆救护车送我去医院，这是高速公路翻车所需的程序，尽管我知道自己很好。我身上没有一丝划痕，头发纹丝不乱，意识完全清楚。不知道这是怎么发生的。

在上救护车之前，我向每一个陪伴我近一个小时的陌生人询问他们的联系方式，以便我可以在第二天早上给他们打电话，感谢他们的支持。第一个人给了我他的名片，他是一家国际银行的高管。这位银行家确保我获得了机构的支持以及相应的资源。事故发生的时候，他恰好驾车在我的后面。他拨打了紧急电话 911，确保我有所需的信息和文件。他协助处理了文书工作。他是一位银行家。第二个人也给了我他的名片，他是当地消防站的站长。就在那一刻，他恰好开车经过事故现场。消防员所做的是保护附近区域免受危险的侵袭，以确保我们的环境安全。他负责协调来来往往的应急人员小组的紧急响应。他是一名消防员。第三个人不情愿地将他的名字写在一张纸片上。他没有名片。第二天，当我查找并联系他的时候，

the police, a state trooper, a tow truck, a fire truck. One by one, each driver who came and went, echoed the strangers' response: they looked at the car, looked back at me, and shook their heads. "I don't know how this could be." Finally, after nearly an hour, an ambulance came to take me to hospital which is the protocol required for a highway rollover, even though I knew I was perfectly fine. Not a scratch on me, not a hair out of place. completely clear. Don't know how that happened.

Before I went into the ambulance, I turned to each of the strangers who had stayed with me nearly an hour, and asked for their contact information so I could call them the next morning and thank them for their support. The first man gave me his card; he was an executive of an international bank. The banker ensured that I had institutional support and access to resources. He happened to be driving behind my vehicle, when the crash happened. He called the emergency number 911. He made sure that I had the information and documentation I would need. He dealt with the paperwork. He was The Banker. The second person gave me his card; he was the Chief of the local fire station. He happened to be driving past the crash site at that precise moment. The firefighter safeguarded the immediate vicinity from hazard, he kept our environment secure and safe. He coordinated the emergency response from the teams of emergency people coming and going. He was the Firefighter. The third person reluctantly gave me his name scratched onto a scrap of paper. He had no business card. And when I looked him up to reach out the next day, the only information I could find was that he was a member of several anarchy groups. He was The Anarchist. He took matters, and me, into his own hands when he single-handedly carried me to safety from the car. He was equipped with individual initiative, self reliance and a first aid kit. I said goodbye to the Banker, the Firefighter, and The Anarchist, and I went into the ambulance.

## Lesson #3: We Are Here To Do This Work

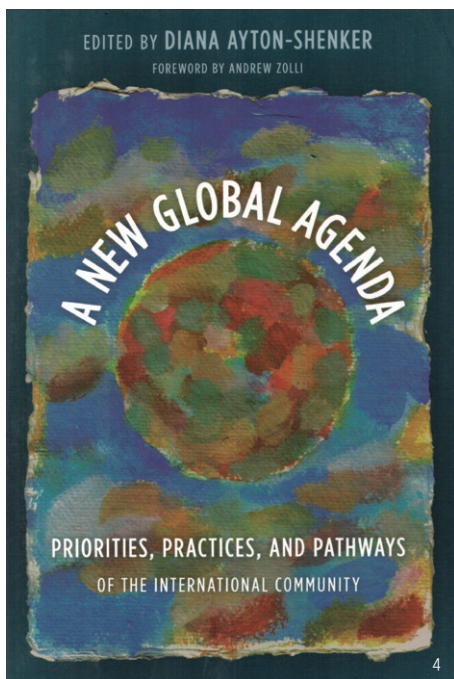
About an hour after the crash, I settled into the ambulance and the shock started to sink in to me of what had just happened. Involuntarily, I said out loud: "I'm so glad I'm alive!" The Emergency Medical Technician (EMT) looked at me, looked at the crashed vehicle, then shook her head just as everyone else had who witnessed the scene of the accident. She said very simply and directly, "This was not your time to go." Instantly, I heard another voice as if someone was standing and speaking right in front of me, saying, "You are here to do this work." Not your job, not your title, not your profession, not even your career. We are here to do this work.

The next day, I reached out to the Banker, the Firefighter and the Anarchist, wanting to thank them and let them know I was okay. They each responded with the same words verbatim. Independently, they each said, "I just did what anyone else would do." But they are the ones who



*Eau de Jardin 2004, by Christa Sommerer & Laurent Mignonneau*  
Photo Credit: Tobias V. W.

3. 《花园之水》(Eau de Jardin), 2004, 由克里斯塔·索默尔 (Christa Sommerer) 和洛朗·米尼诺 (Laurent Mignonneau) 设计



4. 《新全球议程：国际社会的优先事项、实践与路径》封面

5. 增强现实雕塑装置《新巴别塔》可以通过智能手机的屏幕观看

我能找到的唯一的的信息是：他是几个无政府组织的成员，他是无政府主义者。当他单枪匹马把我从车上抬到安全地带的时候，他把事情和我都掌握在自己手中。他有个人主动性、自力更生能力和急救箱。我告别了银行家、消防员和无政府主义者，然后上了救护车。

### 第 3 个教训：我们来这里是为了完成这项工作

事故发生后大约一个小时，我坐进救护车，刚刚发生的事让我震惊不已。我不由自主地大声说：“我很高兴我还活着！”紧急医疗技术员（EMT）看了看我，又看了看被撞毁的车辆，然后像其他目睹事故现场的人一样摇了摇头。她说得非常简单直接：“现在不是你离开的时候。”立刻，我听到另一个声音，好像有人站在我面前说：“你是来完成这项工作的。”这不是你的本职工作，无关你的头衔和专业，也不是你的事业。我们来这里是为了完成这项工作。

翌日，我联系了银行家、消防员和无政府主义者，希望感谢他们并让他们知道我无碍。他们每个人都逐字地回答了同样的话：“我只是做了别人会做的事。”而他们正是在那一刻选择这样做的人。那是他们当时、在那个地方的工作。我分享这个故事是因为有时候在特定的语境中，我们可能需要呼吁每个人都成为一名银行家、消防员，甚至是无政府主义者。我们的工作就是认识并抓住这些人与人之间相互联系的时刻。因为也许其他人都会挺身而出，但总有一天，你可能会成为接收到或就这项号召发出请求的人。

### 创造力的惊人力量

与设计一样，人与人之间的联系通常始于一个故事，比如起源故事、爱情故事、恐怖故事、寓言。为什么会这样？因为故事可以真正同步我们的心灵和思想，引发共同的经历和敬畏感。一个引人入胜的故事或艺术品

did so at that moment. That was their work at that time, in that place. I share this story because there will come moments when each of us may need to call on or become a banker, a firefighter, or even an anarchist. Our work is to recognize and seize these moments of human connection. Because perhaps anyone else would rise to the occasion, but there comes a time when you need to be the one who answers or requests that call.

### THE AWESOME POWER OF CREATIVITY

Like design, human connection often begins with a story. Origin stories. Love stories, Scary stories. Fables. Why is this? Storytelling has the power to literally synchronize our hearts and minds, generating a shared experience and sense of awe. A captivating story or work of art can actually recalibrate the heart rate, breath rhythm, and mood of viewers or listeners to be attuned with each other. When we collectively focus on a compelling narrative, we become more attentive, receptive, and empathetic. This is the power of storytelling, the power of engaging in creativity, and the power of recognizing that we belong to something larger than ourselves.

#### Approaching a State of Awe

Sharing a creative experience, not only deepens social connection, it opens pathways to approach a state of awe. Awe, as defined by Dr. Dacher Keltner in his book, *The State of Awe: the Transformative Power of Everyday Wonder*, is a perceived vastness and sense of wonder, and it plays a crucial role in mental and physical well-being. Cultivating awe



事实上可以重新调整观众或听众的心率、呼吸节律和情绪,使彼此协调一致。当我们共同关注一个引人入胜的故事的时候,我们会变得更加专注,更愿意倾听,更富有同理心。这就是讲故事的力量、参与创造的力量,以及认识到我们属于比我们自己更伟大的事物的力量。

### 接近敬畏的状态

分享创意体验不仅可以加深社交联系,还可以打开通往敬畏状态的途径。正如达彻·凯尔特纳博士在其著作《敬畏的状态:日常奇迹的变革力量》中所定义的那样,敬畏是一种能感知到的浩瀚和惊奇感,它在身心健康中发挥着至关重要的作用。通过创造力培养敬畏感至关重要,尤其是在面对前所未有的挑战的时候。为什么体验敬畏的状态如此重要?凯尔特纳的研究强调了敬畏的益处,包括改善和优化身体健康状态、思维清晰度、功能特性、执行业绩以及整体活力。鉴于这些积极的因素,凯尔特纳的研究概述了多种策略,即通过设计有意培养敬畏状态。设计创意体验尤为重要,因为它是实现敬畏体验的三种主要方式之一:当我们目睹或体验人类善良的时候,当我们目睹或体验自然时,以及当我们目睹或经历创意灵感时,创造力的力量,无论是通过综合艺术、科学、技术还是设计,都是令人惊叹的。

在从事与创造力相关的活动时,我们不仅会达到这种对我们身心健康非常有帮助的敬畏状态,而且还会提高集中注意力、专注、投入学习、创新教学和创造性解决问题的能力。这些是当下社会比以往任何时候都更加需要的关键技能,它们可以帮助我们应对这个时代前所未有的挑战。创造性地解决问题,对于解决当今和未来世界的复杂问题至关重要。为了孵化创造力,我们需要重新构想教育,从创意先锋那里学习新的经验教训。

### 创意先锋

创意先锋们会想象未来会发生什么,他们实验、探索并设想如何前进。通过《莱昂纳多》/ ISAST (国际艺术、科学、技术协会) 等合作社区,创意先锋们可以参与《莱昂纳多》的尖端出版物、LASER 演讲人系列、沉浸式驻地艺术家项目、虚拟联谊、创意孵化器、实验媒体艺术、社区建设项目,以及世界各地的 Leosphere 合作伙伴网络。(译者注:LASER 演讲:Leonardo/ISAST LASER Talks 是一项国际聚会计划,将艺术家、科学家、人文主义者和技术专家聚集在一起,与更广泛的公众进行非正式演示、表演和对话。LASER 的使命是通过促进跨学科对话和为全球五大洲 50 多个城市提供社区建设机会,鼓励为该地区的文化环境做出贡献。详见:<https://leonardo.info/laser-talks>)。需要特别指出的是,《莱昂纳多》/ ISAST 通过与清华大学、麻省理工学院出版社和亚利桑那州立大学的独特合作伙伴关系提供创造性的参与,亚利桑那州立大学校长迈克·克劳向我们传达了这样的信息:我们需要疯狂的创新!这就是创意先锋所做的事情。除了《莱昂纳多》/ ISAST 之外,我有幸见证了社会设计领域的创意先锋们致力于创建、建立或推进国际人权法、社会创新和创业、影响力投资、风险慈善事业、创意企业以及跨越所有创意事业领域的努力。

娜塔莉·尼克松在其著作《创造力的飞跃》中提醒我们:“创造力是在和惊奇之间切换的能力。”脑科学图像的新进展提供了大脑进行高度创造性思维或实践时的可视化图像。脑部核磁共振成像捕捉到了尼克松在“严谨与惊奇之间”的流动的思想。这种流动不只体现在大脑中的一个,而是三

through creativity is essential, especially in the face of unprecedented challenges. Why is it so important to experience a state of awe? Keltner's research underscores the benefits of awe, which include improving and optimizing states of physical health, mental clarity, functional and executive performance, and overall vitality. Given these positive benefits, Keltner's research outlines multiple strategies to intentionally cultivate the state of awe by design. Designing creative experiences is particularly important as one of the three primary ways to approach the experience of awe: (1) when we witness or experience human kindness, (2) when we witness or experience nature, and (3) when we witness or experience creative inspiration. The power of creativity, whether through hybrid art, science, technology, or design, is literally awesome.

When we engage in creativity, not only do we approach this state of awe that is immensely helpful for our mental and physical well-being, but we also increase capacity for concentration, focus, engaged learning, innovative teaching, and creative problem-solving. These are the critical skills that society needs now more than ever, in order to navigate the unprecedented challenges of our time. Creative problem-solving is essential to answer the complex problems of our world today and tomorrow. To incubate creativity, we need to reimagine education, learning new lessons from creative pioneers.

### Creative Pioneers

Creative pioneers imagine what comes next, They experiment, explore and envision how to move forward. Through collaborative communities like *Leonardo/ISAST* (the International Society of Arts, Science and Technology), creative pioneers engage with *Leonardo's* cutting-edge publications, LASER speaker series, immersive residencies, virtual fellowships, creative incubators, experimental media arts, community-building programs, and the Leosphere network of partnerships around the world. In particular, *Leonardo/ISAST* offers creative engagement through our singular partnerships with Tsinghua University, MIT Press, and with Arizona State University, which brings us the message through ASU President Michael Crow, that we need to “innovate like crazy!” This is what creative pioneers do. In addition to *Leonardo/ISAST*, I've been privileged to witness creative pioneers in social design working to create, establish or advance the fields of international human rights law, social innovation and entrepreneurship, impact investment, venture philanthropy, and creative enterprise across all creative endeavors.

In her book *The Creativity Leap*, author Natalie Nixon reminds us that “creativity is the ability to toggle between rigor and wonder.” New advances in brain science imagery provide visualization of what happens when the brain is engaged in highly creative thought or practice. Brain MRIs capture Nixon's idea of flow “between rigor and wonder” represented across not one, but three highly-activated and essential

个高度活跃的重要网络中。这就是说,创造力并不局限于你头脑中某个“具有艺术气息的”部分!大脑中被创造力激活的相互关联的部分是想象力网络——对应奇迹,执行注意力网络——对应严谨,以及在其他两者之间切换的显著性网络。当大脑发挥创造力的时候,我们实际上会激发并点亮多个大脑中心,使我们能够“把点串连起来”。我们可以通过创新设计教育和实践来培养这种创造力的“全脑思维”。通过“连接点”来识别和生成模式是有效分析和决策的关键,有助于解决复杂且具有交叉性的挑战。这就是为什么将教育重新构想为创造力的孵化器,重新构想教育,超越单向知识的转移,超越静态专业技能的发展如此重要的原因所在。将教育重新想象为创造力的孵化器,将使我们能够突破今天的界限,释放明天的可能性。

在未来的几个月和几年中,《莱昂纳多》正在探索如何突破界限,将教育和其他探究领域重新构想为创造力的孵化器。我们正在考虑通过将《莱昂纳多》实验室作为一个跨机构的网络进行实验,这是一个由《莱昂纳多》和我们的合作伙伴孵化的创意企业和实践集群。这种探索将延续到2028年,即我们成立60周年之际。

### 行动价值

要将教育重新想象为创造力的孵化器,首先要遵循我所说的“行动价值”罗盘的四个基本方向:灵感、意图、诚实正直、影响力。

灵感:行动价值(VIA)的罗盘表明了如何在灵感的指引下前进。灵感询问的是“为什么”,即,激发将教育重新构想为创造力孵化器的驱动目标、动机或促成因素是什么?

意图:行动价值的罗盘以意图为导向。意图询问“什么”,即,它会是什么样子?将教育重新构想为创造力孵化器的愿景、目的和目标是什么?

诚实正直:行动价值的罗盘引导我们诚信地展望未来。诚实正直询问的是“如何”,即,我们如何将创造力集中在教育中,这样它就不会只是事后附加的想法。诚实正直既是不可或缺的又是整体的。

影响力:行动价值的罗盘引导我们走向影响力。这个方向询问的是“那又如何”,即,重新构想教育是如何产生影响力的,而集中创造力又是如何对我们的世界产生影响的。

行动价值的罗盘建立在甘地的遗泽和他“欲变世界,先变其身”的使命之上,通过实现创造性的愿景来“见证你想在这个世界上看到的改变”。通过创造力,我们看到了我们想要的改变,这需要观念上的根本转变。心态转变需要思想和心灵的开放,重置“初学者的心态”以消除偏见,不是忽视或不理会学科的专业知识,而是激发好奇心与乐趣,这样我们就可以以新的方式重新审视世界。

我们需要培养创造力,使其成为更加人性化且更加人道的复杂技能的核心。当复杂的技能组合被轻描淡写地称为所谓的创造力“软技能”时,就会被曲解。更准确地说,复杂的创造力技能是需要教授、培养和孵化的重要核心技能。这不仅仅是某个个体是否具备才华的问题,这是人类与生俱来的权利,也是全球对创造性参与和体验的需求。

复杂的创造力使我们能够将自己作为一个物种的身份变得人性化,即使我们正处于进化过程中。对于人类超越或限制人工智能这样的问题我并不担心。我们不需要比技术更聪明。我们需要使人工智能更加人性化,让

networks in the brain. This is to say that creativity is not limited to one “artsy” part of your head! The interconnected parts of the brain activated by creativity are (1) the Imagination Network, that corresponds to wonder, (2) the Executive Attention Network, that corresponds rigor, and (3) the salience network that toggles between the other two. When our brain is engaged with creativity, we literally fire and light up multiple brain centers allowing us to “connect the dots.” We can cultivate this “whole brain thinking” of creativity through innovative design education and practices. Recognizing and generating patterns by “connecting the dots” is key to effective analysis and decision-making that help address complex and intersecting challenges. Ultimately this is why it is so critical to reimagine education as a creativity incubator, to reimagine education beyond the transfer of one-directional knowledge, beyond static professional skills development. Reimagining education as the incubator of creativity enables us to push the boundaries of today and unleash the possibilities of tomorrow.

In the coming months and years, *Leonardo* is exploring how to push boundaries that reimagine education and other fields of inquiry as creativity incubators. We are considering doing so by experimenting with *Leonardo Labs* as a trans-institutional network of networks, a cluster of creative enterprises and practices incubated through *Leonardo* and our partners leading up to our 60th Anniversary in 2028.

### VALUES IN ACTION

To reimagine education as a creativity incubator, begin by following the four cardinal directions of what I call a “Values in Action” compass: Inspiration, Intention, Integrity, Impact.

Inspiration: The Values in Action (VIA) compass indicates how to go forward led first by Inspiration. Inspiration asks “why?” What is the driving purpose, motivation or prompt that inspires reimagining education as a creativity incubator?

Intention: Secondly, the VIA Compass guides with Intention. Intention asks “what?” will it look like? What is the vision, aim, goal of reimagining education as creativity incubators?

Integrity: Third, the VIA Compass guides us to envision with Integrity. Integrity asks how, how will we center creativity in education, so that it's not an add-on afterthought? Integrity is both integral and integrated.

Impact: Finally, the VIA Compass guides us to Impact. This direction asks “so what?” How does reimagining education make a difference? How does centering creativity impact our world?

The VIA Compass builds on the legacy of Gandhi and his imperative to “Be the change you want to see in the world”, by enabling the creative vision to “See the change you want to be in the world.” Through creativity we see the change we want to be; this requires a fundamental

我们在处理彼此之间的相互关系、我们与资源以及其他人工智能（无论是人工的还是自然的）的关系上变得更加人性化。通过创造力变得更加人性化且更加人道，我们将能更好地进入并拥抱一个充满人类和非人类生命、人类和非人类智慧的跨物种的世界。这就是如何将教育重新构想为创造力的孵化器，借此，我们就可以激发想象力，引发对我们需要看到的积极的未来产生令人费解又令人兴奋的愿景。诸如詹姆斯·韦伯相机拍摄的图像之类的令人惊叹的景象以前所未见的方式瞥见遥远的过去，让受众倍感震惊。标准风险投资公司的创始人乔伊·安德森曾经提醒我们：“相信恩典会给你带来惊喜。”

### 创造力的五项核心实践

我们在这里是为了做这项工作。我们在这里将教育重新构想为创造力的孵化器，将设计教育重新构想为工作室的模式，即以好奇心和同情心作为创造力加速器的价值观推动的终身“协作”模式。我们将如何实现这一点？首先，我们需要在整个人生旅程中进行教学、学习和探究，而不仅仅局限于正规教育期间。其次，正如《莱昂纳多》探索并通过亚利桑那州立大学社会创新峰会介绍的那样，我们依靠五种核心创意实践来重新构想以创造力为中心的教育。我称之为“5C”，核心创意实践包括：创造性沉思（Contemplation）、创造性批评（Critique）、创造性协作（Collaboration）、创造性沟通（Communication）与创造性内容生成（Content generation）。

#### 创造性沉思

创造性沉思邀请我们重新想象一种较为缓慢的紧迫感。正如一句非洲谚语所说的那样：“时间紧迫。让我们放慢脚步吧。”创造性批判邀请我们将静止、沉默、探究、学术和研究重新构想为创造性实践。沉思可以就问题提出质疑，这样我们不仅可以找到更好的答案，而且可以寻求更好的问题。

#### 创造性批评

创造性批评邀请我们通过扩展思维，探索在“大脑之外思考”的力量，探索我们在身体和骨骼中已知的事物，以及我们在集体智慧中所分享的东西。它要求我们将路径重新想象为创意实践，这个灵感来自《莱昂纳多》的 CripTech 孵化器，它教会了我和许多人如何将激进的路径作为创意实践的方式。受到这张美丽的坡道图像的启发，从表面上看，这里是轮椅舞蹈表演的舞台，同时隐喻我们如何在空间中移动，因此，其意义不仅仅在于造福地球上的 10 亿残障人士。（图 2）我们所有人都应该学习并颂扬作为创造性实践的路径。我们与亚利桑那州立大学的星际倡议合作旨在探索以激进的路径作为创造性实践，通过正义、公平、多样性和包容性建构我们在太空实践探索的方式。

#### 创造性协作

创造性协作邀请我们以意想不到的方式进行组合与相互联系。正如克里斯塔·索默尔和洛朗·米尼诺的团队合作创作的精美作品《花园之水》所展示的那样。（图 3）该装置邀请观众参与，尤其是人与作为艺术品呈现的鲜活的植物进行互动，通过数字传感器连接到后面的屏幕，屏幕上则填充了模拟植物的图像，这有关人类与非人类、人类与非人

shift in mindset. Mindset shifting invites an opening of both minds and hearts, resetting a “beginner’s mind” to dispel bias, not to dismiss nor disregard disciplinary expertise, but to invoke a sense of curiosity and playfulness so we might see the world in a new way.

We need to cultivate creativity as the core of the complex skill sets required to become more human, and more humane. Complex skill sets are misrepresented when referred to dismissively as so-called “soft skills” of creativity. More accurately, complex skills of creativity are essential core skills to be taught, cultivated and incubated. This is not about who has talent or not. This is about a human birthright and a global need for creative engagement and experience.

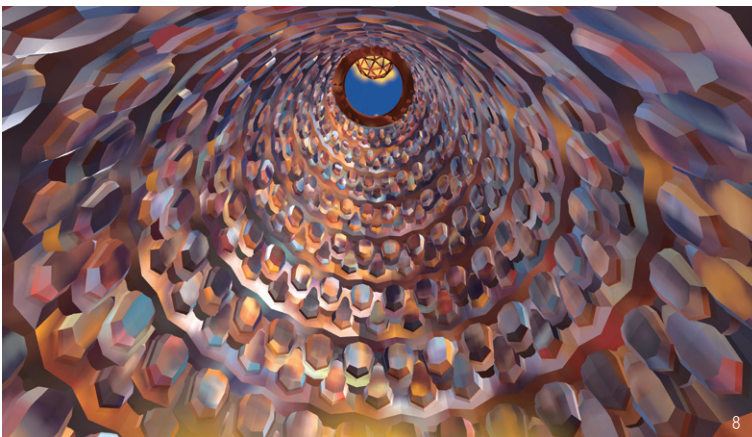
Complex creativity allows us to humanize who we are becoming as a species, even as we are in the process of evolving. I do not worry about humans outpacing or constraining Artificial Intelligence (AI). We do not need to outsmart technology. We need to out-humanize AI, by becoming more humane ourselves in relation to each other, our resources, and other intelligences, both artificial and natural. By becoming more human and more humane through creativity, we will be better able to enter and embrace the reality of an interspecies world teeming with human and non-human life, human and non-human intelligence. This is how to reimagine education as a creativity incubator, so that we might spark imagination to invite mind-bending and mind-blowing visions of the positive future we need to see. Amazing visions, such as images taken from the James Webb camera, surprise viewers with breathtaking, never before seen glimpses into the distant past. Joy Anderson, founder of Criterion Ventures reminds us: “trust grace to surprise you.”

### THE 5 CORE PRACTICES OF CREATIVITY

We are here to do this work. We’re here to reimagine education as a creativity incubator, to rethink educational design as the model of an atelier, of lifelong “Collaboratory” fueled by values of Curiosity and Compassion as the accelerators of creativity. How will we do this? First, we need to be teaching, learning, and inquiring all throughout our lives, not just within the years of formal education. Secondly, as explored through *Leonardo* and introduced through ASU’s Social Innovation Summit, we rely on five core creative practices to reimagine education centered on creativity. Referred to as What I call the five C’s, core creative practices include: creative Contemplation, Critique, Collaboration, Communication, and Content generation.

#### Contemplation

Creative Contemplation invites us to reimagine a slower urgency. As an African proverb teaches, “The times are urgent. Let us slow down.” Creative critique invites us to reimagine stillness, silence, inquiry, scholarship, and research as creative practices in and of themselves. Contemplation questions the questions, so that we may not only find



6—8. 威廉·T. 艾顿的作品《星座 XR》

类生命以及非人类智能之间的互动。

### 创造性沟通

创造性沟通邀请我们以新的、具有创造性的方式重新构想教育，从知识转移到知识生成和知识传播。为了庆祝《莱昂纳多》与麻省理工学院出版社合作 30 周年，我们近年来尝试推出了英语和俄语、英语和西班牙语，

better answers, but seek better questions.

### Critique

Creative Critique invites us to explore the power of “thinking outside the brain,” through the extended mind, what we already know in our bodies and bones, and what we share in our collective intelligence. Creative collaboration asks us to reimagine access as creative practice, inspired by *Leonardo's* CripTech incubator, which has taught me and many of us so much about radical access as an opening to creative practice, inspired by this beautiful image of the ramp to set the stage literally, or metaphorically, literally here for wheelchair dance performance, and metaphorically for how we move through our space not only to benefit the 1 billion people on the planet identify at who identify as disabled. [Figure 2] But all of us to learn from and celebrate access as creative practice. We explore radical access as creative practice, in our work with ASU' s interplanetary initiative to establish access through justice, equity, diversity and inclusion in space.

### Collaboration

Creative Collaboration invites us to combine and connect in unexpected ways. As is demonstrated with a beautiful piece, *Eau de Jardin*, by the collaborative married team of Christa Sommerer and Laurent Mignoneau. [Figure 3] The installation invites viewer engagement and specifically human touch to interact with living plants presented as works of art, connected through digital sensors to the screen behind them that populates with simulated plant images; inspired by the human non-human interaction, human to non human life and to non human intelligence that looks like this.

### Communication

Creative Communication invites us to reimagine education beyond knowledge transfer to knowledge generation and knowledge dissemination in new and creative ways. Celebrating *Leonardo's* 30 year partnership with MIT Press, we have in recent years been able to experiment with multilingual publications in English and Russian, English and Spanish and Catalan, and coming up very soon in English and Chinese. We have also experimented with Augmented Reality (AR) art in the publications, and through our partnerships with Cyland Media Arts Lab, explored thematic foci of “Chaos and Cosmos,” “Fermentation,” and “Vulnerability.”

### Content

The first four core creative practices (communication, collaboration, critique and contemplation,) combine to inform the fifth “C” , Creative Content generation. In terms of Creative Content Generation, I'm going to share a few of my personal collaborations and projects that I have been privileged to engage with in recent years.

### New Babel

During the three-year, Global Catalyst Senior Fellowship I held in

以及加泰罗尼亚语的多语言出版物，并且很快就会推出英语和中文的双语版本。我们还在出版物中尝试了增强现实（AR）艺术，并通过与 Cyland 媒体艺术实验室的合作，探索了“混沌与宇宙”“发酵”和“脆弱性”等专题。

### 创造性内容生成

前四个核心创意实践（沟通、协作、批评与沉思）相结合，形成了第五个“C”，即创意内容生成。在创意内容生成方面，我将分享我近年来有幸参与的一些个人合作项目。

### 新巴别塔

在与纽约市新学院联合组织的为期三年的“全球催化剂高级奖学金”期间，我有机会与来自世界各地不同学科和领域的思想领袖合作，确定并发布了《新全球议程：国际社会的优先事项、实践与路径》（罗曼 & 利特菲尔德，2018）。我们用我的合作伙伴威廉·T. 艾顿的艺术作品以视觉的形式来阐释这本书。议程的封面是一幅名为《新世界》的原创作品。（图4）这幅画作启发了数字图像《新世界之城》，而后者又启发了增强现实（AR）装置作品《新世界之城》。该装置获得了2112基金会颁发的2020年度远见奖。创意内容的生成使我们能够重新想象自己所处的世界。《新巴别塔》是与艾顿的另一次合作，采用了与《新全球议程》书籍封面上所展现的有关新世界绘画相同的图像，将其转换为增强现实版的《新世界》，为一个高达8层的球体贴上了壁纸纹理，该球体在10层的高楼楼顶上旋转——2019年，在纽约市联合广场中央安装了这座增强现实塔。艾顿创作的这座高达18层的增强现实雕塑装置《新巴别塔》可以通过智能手机的屏幕观看，借此，观众可以在手中握住一座数字摩天大楼，同时看到背景中的实体摩天大楼。（图5）《巴别塔》是由来自6个不同国籍和不同学科的六人团队创建的，旨在激发一种看待世界的新方式。创意内容生成的迭代过程仍在继续。《新巴别塔》还激发了其他作品和正在进行中的作品，其中包括一项名为《星座XR》的新倡议。

### 星座XR

艾顿的作品《星座XR》用36个数字公共艺术网络节点包裹地球。（图6—8）每个装置（受到《新巴别塔》的启发）都具有标志性的塔以及XR轨道球体，以激发洞察力、导航路径并揭示环绕地球的传导门户模式，成为一种行星治愈工具，即通过艺术体验启发人们达到治愈效果的方法。其最终目标是治愈（H.E.A.L.），即带着希望（Hope）、同理心（Empathy）、敬畏（Awe）和爱（Love），通过艺术将世界各地的人们联系起来。作为在未来6年中即将推出的36个数字公共艺术装置的网络系列之一，《星座XR》呈现了世界上第一个全球性的增强现实艺术合作。每个装置都以新巴别塔为中心，并具有7个增强现实球体，展示来自当地合作伙伴的不同数字资产，传达他们的韧性和社区的积极参与。在塔的内部，以图像的形式描绘了多向元素的组合，结合了有机、自然、数字和工业材料。穿过塔楼呈下降趋向的是能量流，描绘了我们从情报、产业和环境中的东西。继而，能量循环通过塔上升巡回，进入再生循环。地球上的每个装置都是迭代的，可以尝试根据具体的语境定制塔楼以反映其所在位置。《星座XR》的灵感还

collaboration with The New School in New York City, I was able to work with two dozen thought leaders from around the world drawing from different disciplines and fields to identify and publish *A New Global Agenda: Priorities, Practices, and Pathways of the International Community* (Rowman & Littlefield, 2018). Illuminating this book with art by my partner, William T. Ayton, we featured the painting seen on the cover, an original piece called *A New World*. [Figure 4] This painting inspired the digital image of New World City that then inspired the Augmented Reality (AR) sphere installation, *New World City*, which received the 2020 Visionary Award from the 2112 Foundation. Creative content generation allows us to reimagine our world. *New Babel*, another collaboration with Ayton art, took that same image of the New World painting from *New Global Agenda* book cover, converted into the Augmented Reality *New World*, and wallpapered or textured an 8-story tall orb rotating on top of a 10-story tall, Augmented Reality tower that was installed in the middle of Union Square in New York City in 2019. Viewable through smart phone screens, *New Babel*, Ayton's 18-story tall AR sculpture installation, allowed viewers to hold in their hands a digital skyscraper, while simultaneously seeing the physical skyscrapers in the backdrop. [Figure 5] To inspire a new way of seeing our world, *New Babel* was created with a team of six people from six different nationalities and different disciplines. The iterative process of creative content generation continues as *New Babel* also inspires additional works and works-in-progress, including a new initiative called *ConstellationXR*.

### ConstellationXR

Ayton's *ConstellationXR* wraps Earth with 36 networked nodes of digital public art. [Figure 6-8] Each installation features an iconic tower (inspired by *New Babel*) and orbiting spheres of XR assets to inspire insight, navigate pathways and unveil patterns of conductivity portals encircling the globe as a vehicle for planetary healing. The ultimate aim is to H.E.A.L. with Hope, Empathy, Awe, and Love, connecting people around the world through art. *ConstellationXR* presents the world's first global AR art collaboration as the networked series of 36 digital public art installations being rolled out over the next six years. Each installation centers around the New Babel tower, and features seven AR spheres that showcase different digital assets from local partners conveying their resilience and community-activated engagement. Inside of the tower, images depict the combination of multi-directional elements, combining organic, natural, digital and industrial materials. Descending down through the tower is an energy flow depicting what we receive from intelligence, from industry, from the environment. The energy loop then ascends back up through the tower, circling into a regenerative cycle. Each installation around the planet is iterative, experimenting to contextually customize the towers reflecting its host location. *ConstellationXR* is also inspired by Nikola Tesla's vision of towers as vehicles for communication information and energy to be exchanged, so that the 36 installations encircle the globe with a digital connecting portal of creative content that HEALS with

来自尼古拉·特斯拉的愿景，即以塔楼作为通信信息和能源交换的载体，因此 36 个装置通过创意内容的数字连接门户环绕全球。

## 重新构想教育

这是我们来这里要做的工作。我们在这里将教育重新构想为创造力的孵化器，借此可以超越通过简单地转移学术研究为社会提供信息的方式，而转向以共同创造来改变社会的想法。我们在“行动价值观”罗盘的指导下做到了这一点，培养沉思、批判、协作、沟通和内容生成的核心创意实践。这给了我们一个很好的机会来超越这个前所未有的时代所面临的挑战。我们在这里将教育重新构想为创造力孵化器。这一切从这里开始，从现在开始。

### 一个与爱有关的故事

为了给这些想法做一个总结，我最后希望分享一个非常简短的故事。这是一个与爱有关故事，是对我们的数字时代和手机的一种回应。有时候，在看到社交媒体中出现美丽的图像时，我可能会尝试通过添加“竖起大拇指”来表达我喜欢所发布的图像或是想法，我也许会添加一颗心，抑或会写下评论：“喜欢这个！”几年前，我看到一位多年未见的朋友发布的一张照片。这是一张她和家人在地上打滚大笑的精彩照片，没有丝毫做作，也没有特别奉承任何人，只是呈现了这一刻的无比欢乐。于是我就去写了一条评论：“喜欢这个！”不过，我的智能手机自动将我的声明“喜欢这个！”纠正为“就这样生活吧！”请试想一下，如果我们都可以选择按照自己喜欢的方式生活，这就是我们开始接近敬畏状态的方式，这种敬畏状态使我们能够创造性地解决问题，发散性地思考问题。

我们来这里是为了做这项工作。我们来这里是为了分享我们的故事。我们来这里是为了变得更加人性化、更加入道。我们在这里将教育重新构想为创造力孵化器，以便重新构想我们的世界。

注释：

[1] 译者注：1968 年，动态艺术家和航天先驱弗兰克·马利纳在巴黎创办了《莱昂纳多》，他认为期刊需要成为艺术家之间的国际交流渠道，重点关注运用科学并开发新技术的艺术家作品。《莱昂纳多》由麻省理工学院出版社出版，已成为关于当代科学技术在艺术和音乐中的运用以及艺术和人文科学对科学技术的应用及影响的、在国际上具有领先地位的同行评审期刊。详情请见 [leonardo.info](https://leonardo.info) 以及 <https://leonardo.info/home>。

hope, empathy, awe and inspiration.

## REIMAGINE EDUCATION

This is the work we are here to do. We are here to reimagine education as a creativity incubator so that we might move beyond simply transferring academic research and scholarship to inform society, rather co-creating ideas that transform society. We do this guided by the Values In Action Compass, cultivating core creative practices of Contemplation, Critique, Collaboration, Communication and Content generation. This gives us a good chance, I think one of the best chances, to transcend the challenges that we are facing in this unprecedented time. We are here to reimagine education as a creativity incubator. And this starts here and it starts now.

### A Love Story

To conclude these thoughts, I share a final, very short story. This is a love story that is a response to our digital time, our digital era and our cell phones. Sometimes, when I see beautiful images that come into my social media feed, I might attempt to show that I like the image or idea posted, by adding a “thumbs up”. Alternatively, perhaps I add a heart. Sometimes I write the comment “love this!” A few years ago now, I saw a photograph posted by a friend of mine whom I hadn't seen in years. It was a wonderful photograph of her with her family rolling on the ground laughing, not staged, not particularly flattering of anyone, just this moment of unmitigated joy. So I went to write a comment, “love this!” But my smartphone autocorrected my declarative “love this!” to the imperative, “live thus!” Live thus! Imagine if we all could choose to live according to what we love. This is how we begin to approach that state of awe that opens us to creative problem-solving, to divergent thinking.

We are here to do this work. We are here to share our stories. We are here to become more human and more humane. We are here to reimagine education as a creativity incubator, so that we might reimagine our world.

Notes :

[1] Editor' s notes: Leonardo was founded in 1968 in Paris by kinetic artist and astronomical pioneer Frank Malina who saw the need for a journal to serve as an international channel of communication among artists, with emphasis on the writings of artists who use science and developing technologies in their work. Published by The MIT Press, Leonardo has become the leading international peer-reviewed journal on the use of contemporary science and technology in the arts and music and the application and influence of the arts and humanities on science and technology. For more information, please visit [leonardo.info](https://leonardo.info) and <https://leonardo.info/home>.