



Welcome

to the 20th World Sterilization Congress



Bio-Inspired Medical Devices



Paul Breedveld
Delft University of Technology

**Video courtesy of
Henrik Scharfe, Geminoid DK**

**Music by
MacGregor Campbell**

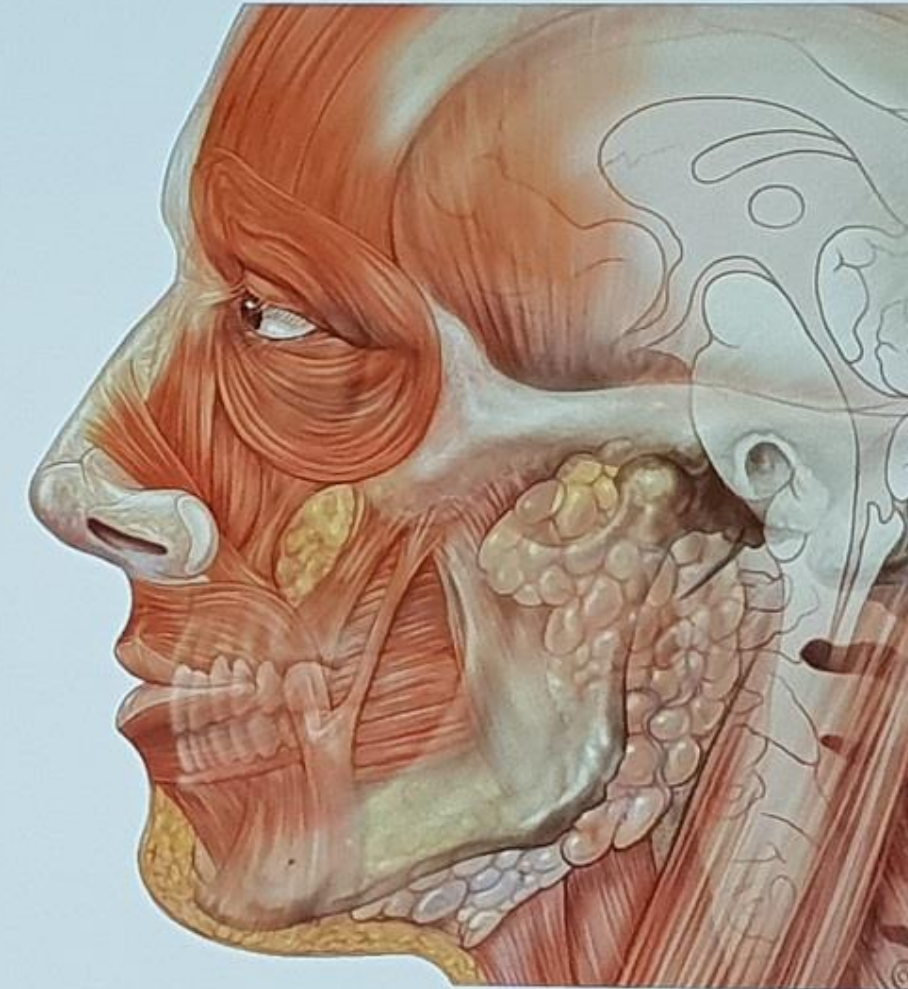
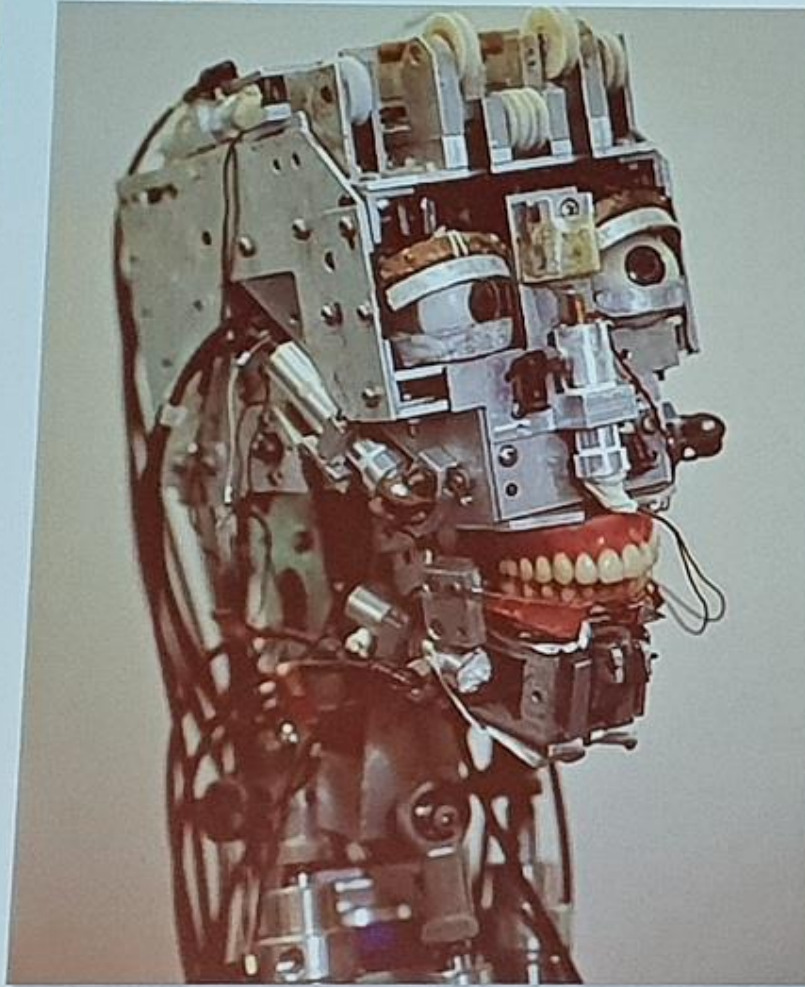
NewScientist

more at www.newscientist.com

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1. Technology and Biology





- BITE - Bio-Inspired Technology Group
- RESEARCH PROJECTS
- BRIDGING TECHNOLOGIES
- UPPER LIMBS
- HEAR
- ACQUISITION
- PROSTHESIS
- MOBILITY
- COLLABORATION
- RESEARCH
- PUBLICATIONS
- CONTACT

RESEARCHERS

PROSTHESIS DEVELOPMENT: HANDS ON

HEAR: FROM A BIO-INSPIRED DEAFNESS INSTRUMENT TO A NEW HEARING DEVICE

ACQUISITION: PROGRESS THROUGH 3D PRINTING AND A SMARTPHONE APP

THE HUMAN DIGITAL: FROM 3D PRINTING TO A SMARTPHONE APP

THE PROSTHESIS: CREATING

WELCOME

... is the official webpage of BITE, the 'Bio-Inspired Technology' research group of Delft University of Technology. Our group is part of the department of BioMechanical Engineering within the faculty of BME. Within the group we strive for the development of innovative technical systems and instruments for minimally invasive surgery, drawing inspiration from extraordinary biological mechanisms. We cooperate with several academic hospitals, biology groups, veterinary hospitals, and companies to achieve our ultimate goal: making the world a little bit healthier.

Latest posts



www.bitegroup.nl

ments



BITE - Bio-Inspired Technology Group

Bring these projects through our research

- RESEARCH PROJECTS
- DEVELOPED INSTRUMENTS
- UPDATES
- NEWS
- AGENDA
- UPDATES
- VIDEOS
- COLLABORATION
- NEWS
- PUBLICATIONS
- CONTACT

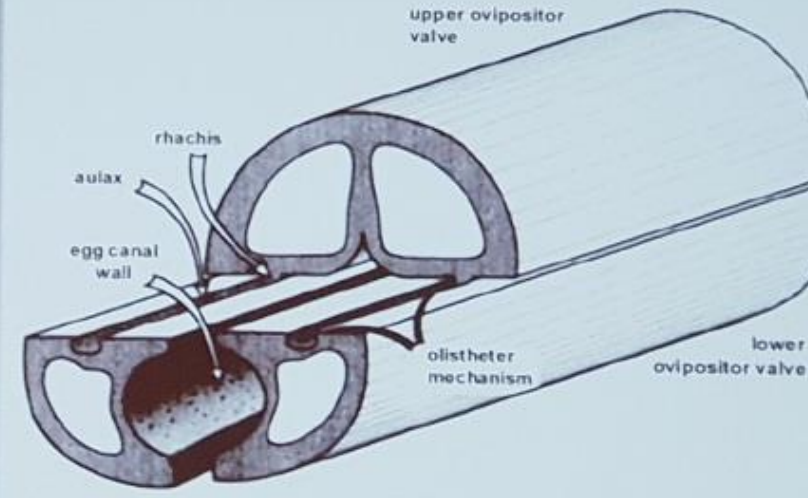
RESEARCH

Research on human health
 Bite
 Mini-Pan: A Bio-Inspired
 Surgical Instrument for
 Minimally Invasive Surgery
 Assistance: Promoting
 Bioprinting and a Sustainable
 All
 The Golden Dragon: Biomimetic
 Inspiration for
 The Bio-Inspired Group

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Latest posts

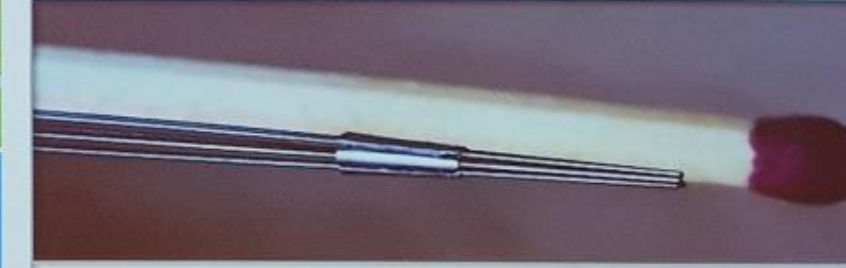
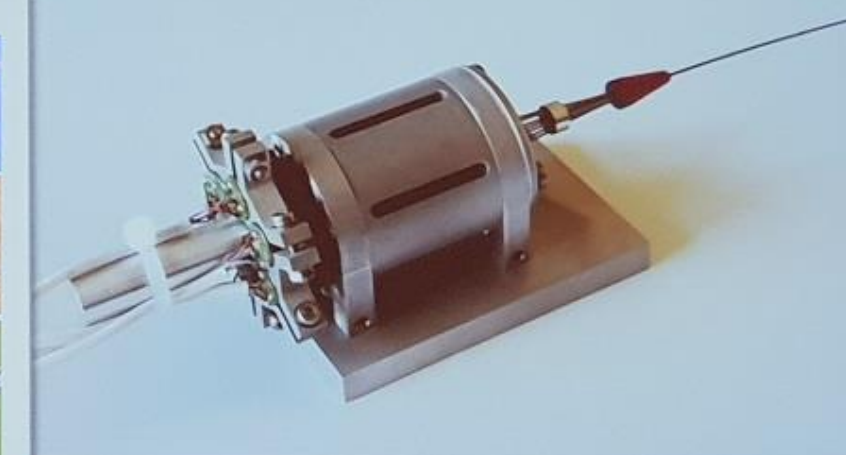


ments

WELCOME

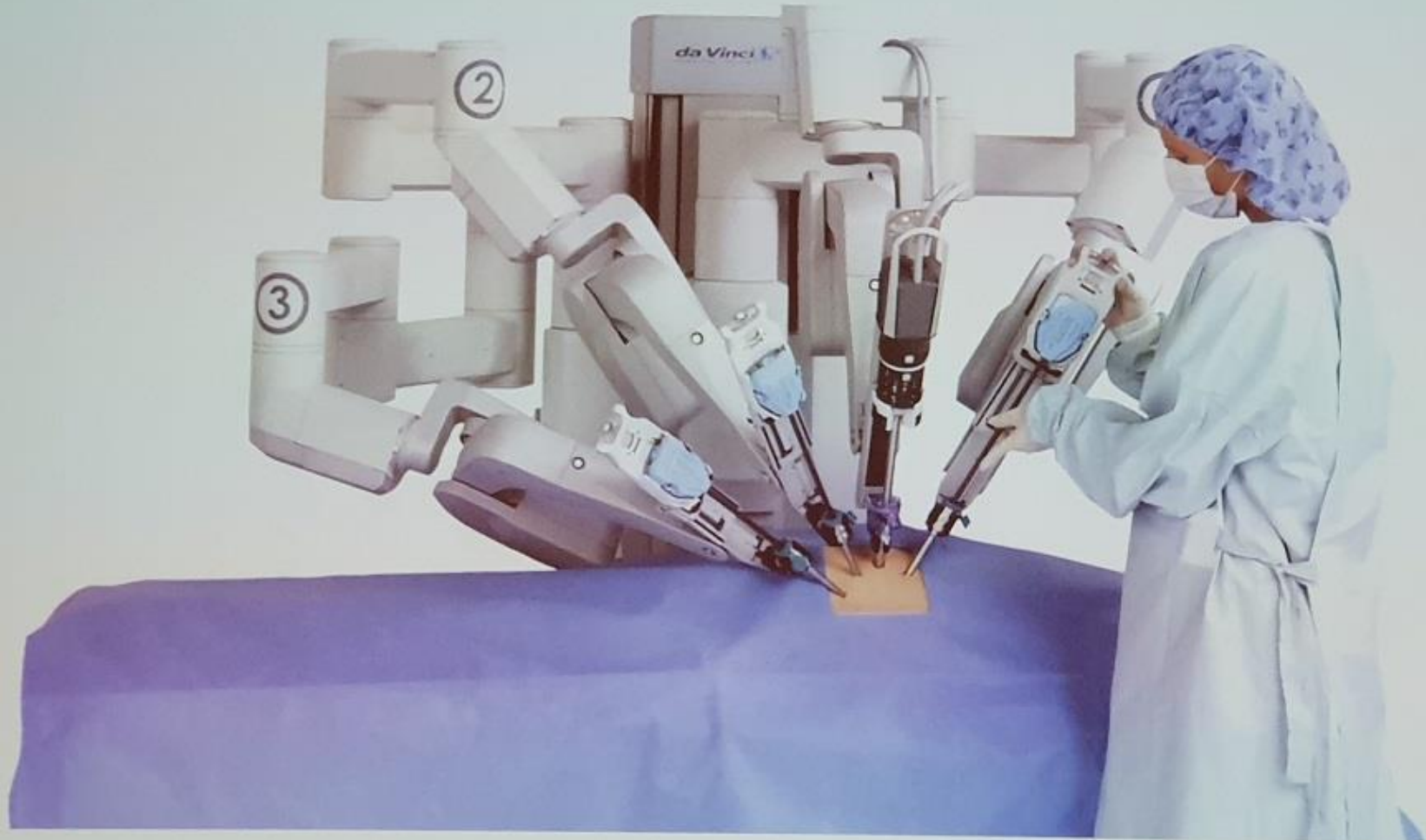
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Latest posts





1. Technology and Biology





1. Technology and Biology





1. Technology and Biology





1. Technology and Biology





1. Technology and Biology

2012-2017:
DragonFlex

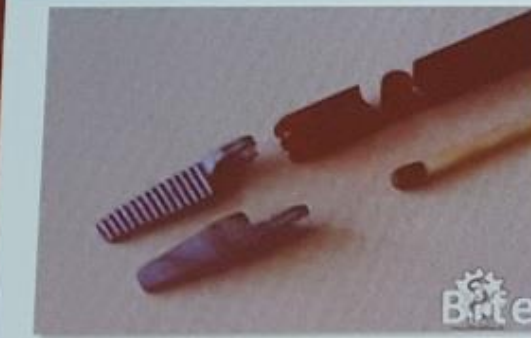




1. Technology and Biology



2017-2018:
VOLT



www.bitegroup.nl

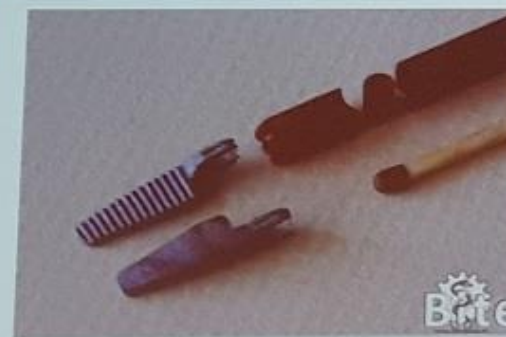


1. Technology and Biology

2012-2017:
DragonFlex



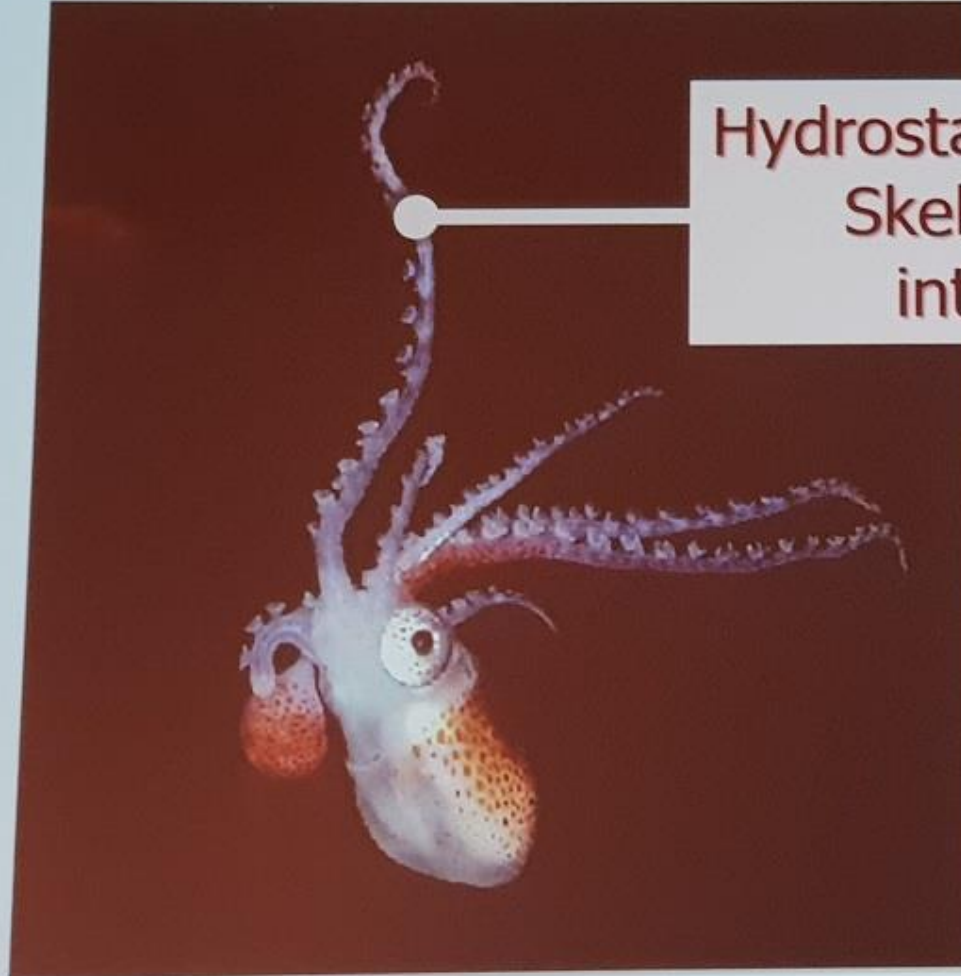
2017-2018:
VOLT



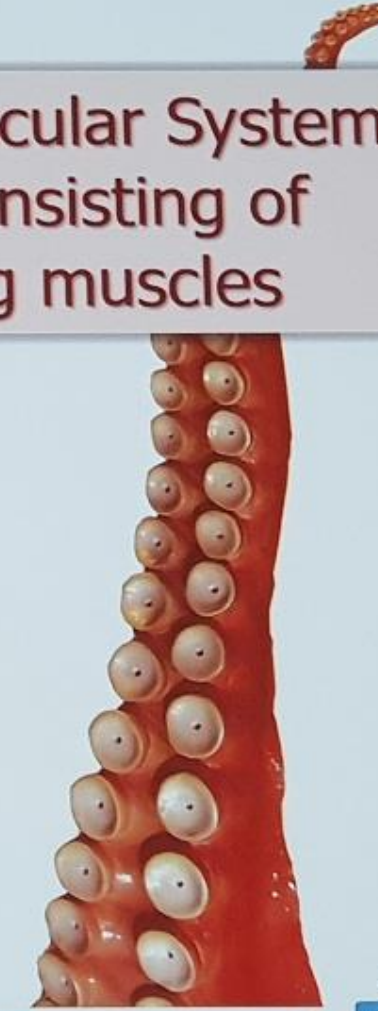
www.bitegroup.nl



1. Technology and Biology

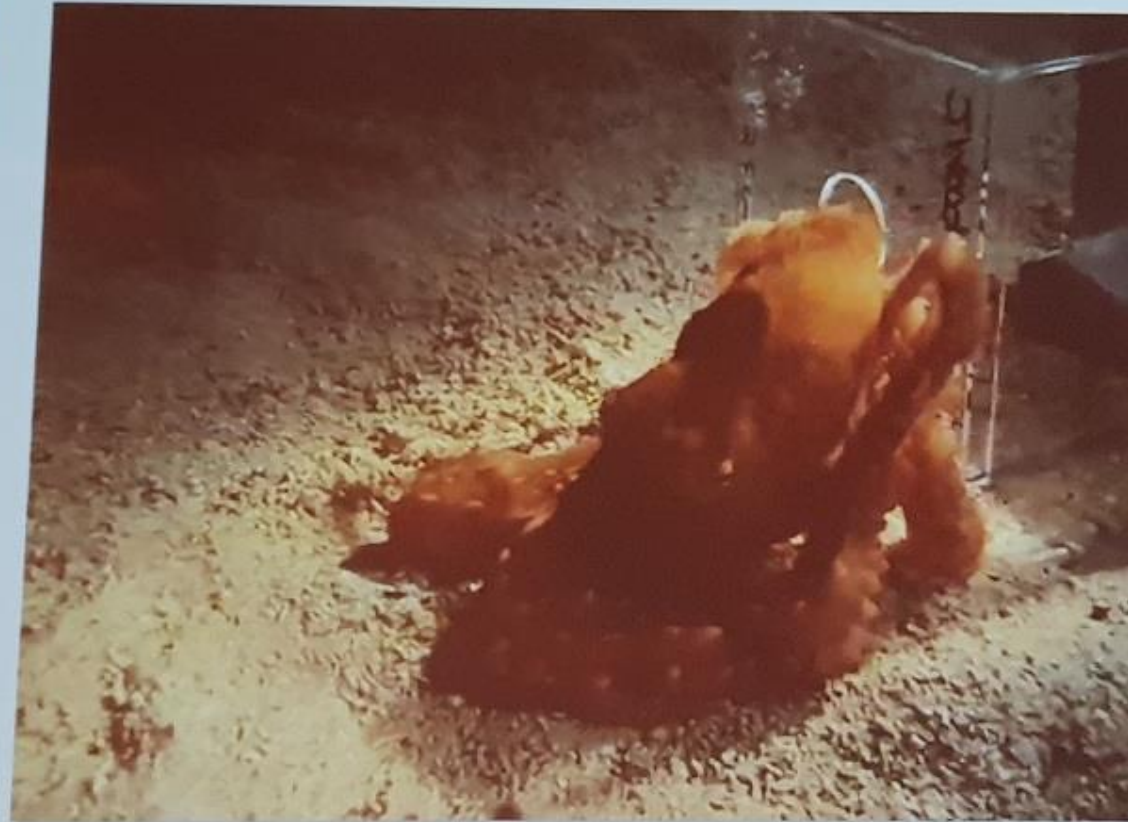


Hydrostatic Muscular System =
Skeleton consisting of
interacting muscles



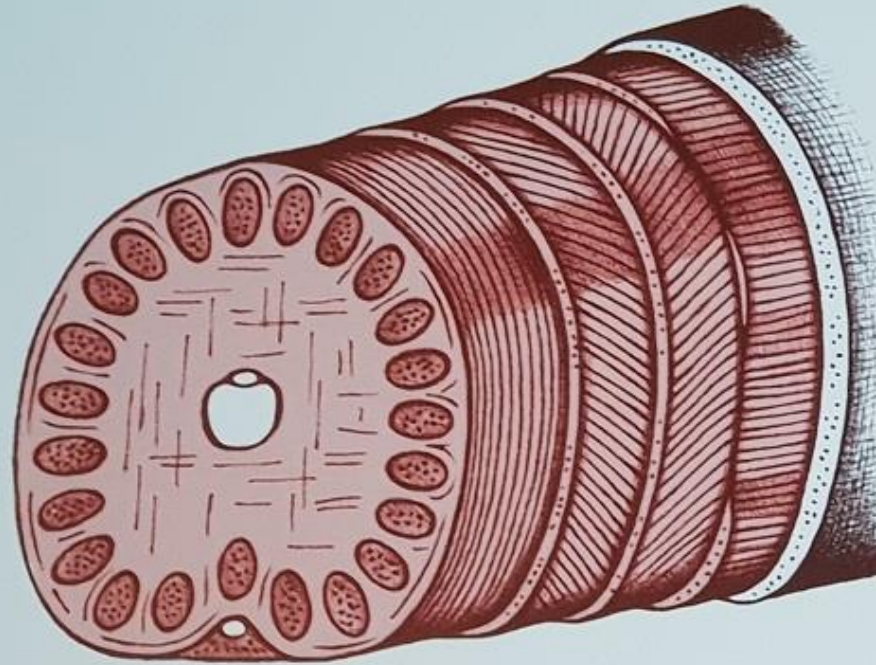


1. Technology and Biology



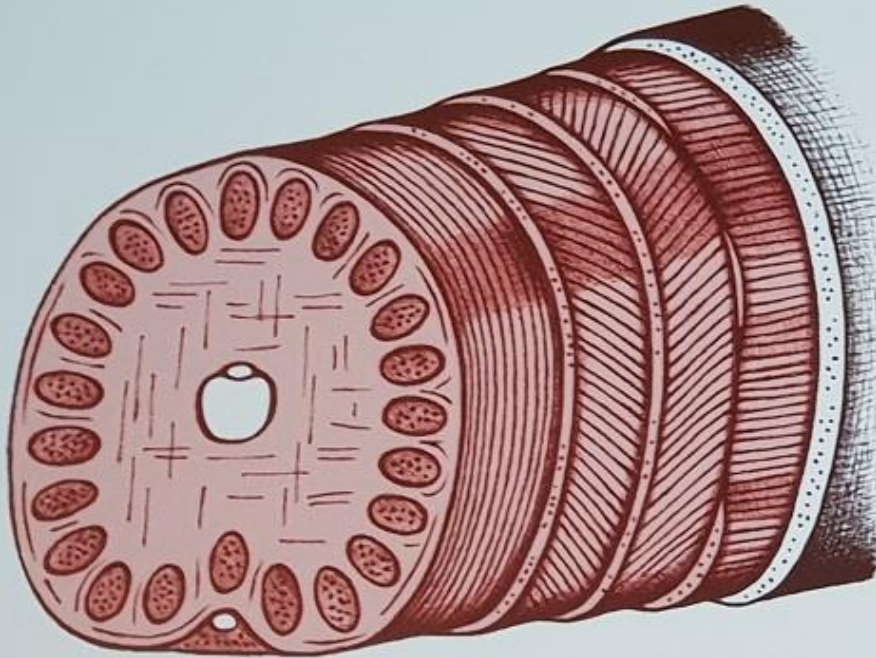


1. Technology and Biology



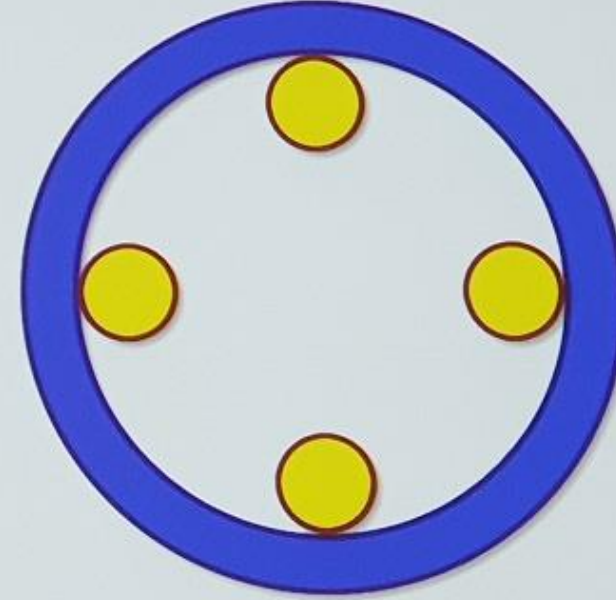
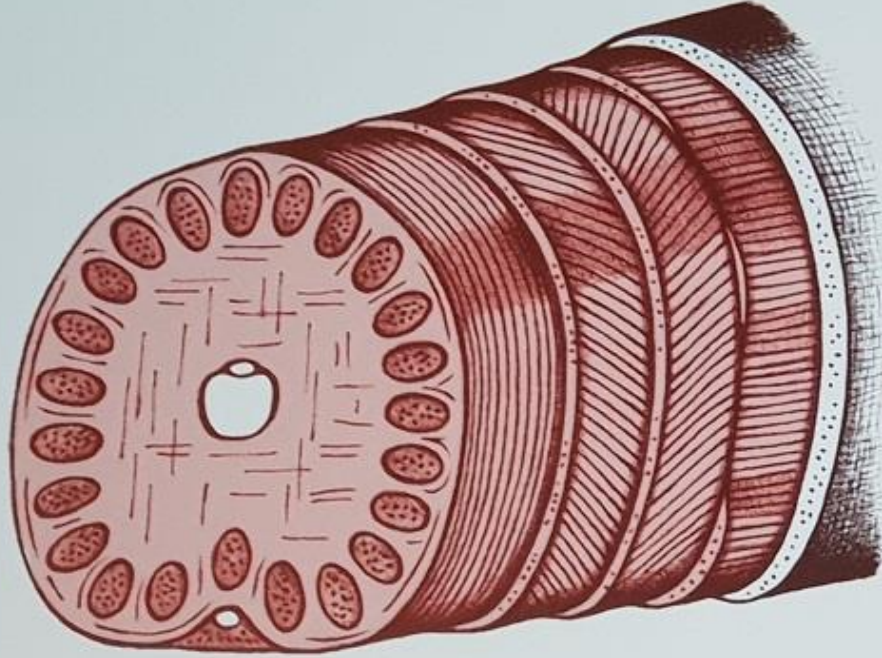


2. Complexity and Simplicity



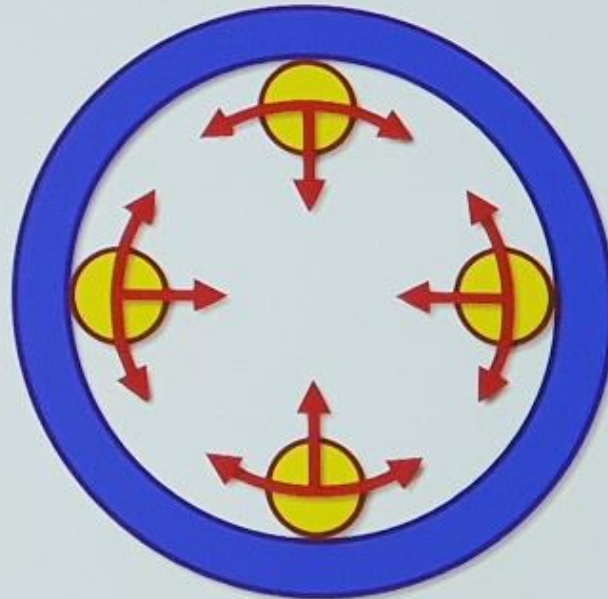
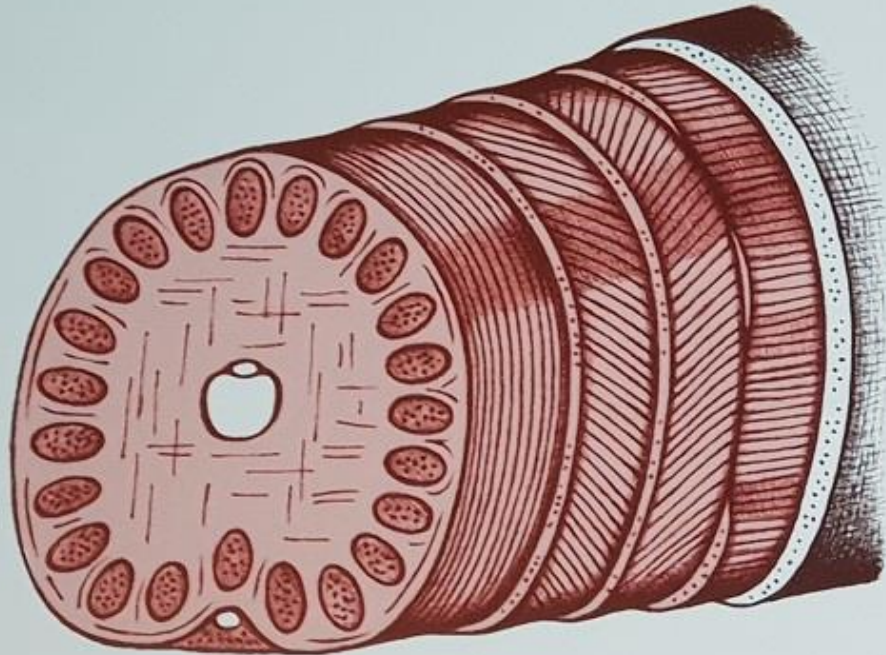


2. Complexity and Simplicity



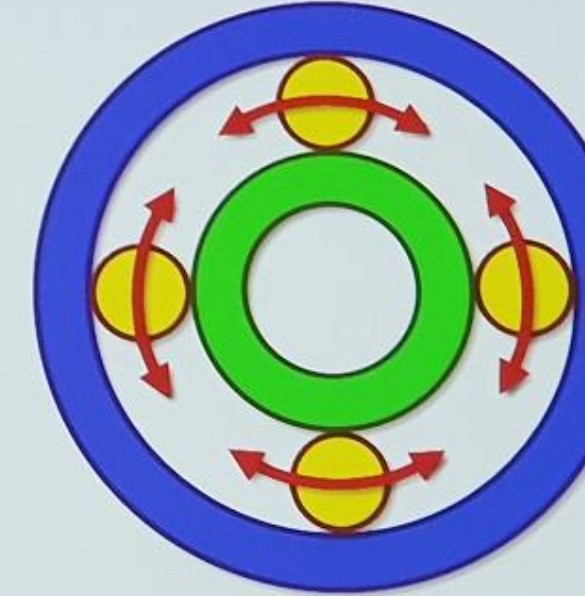
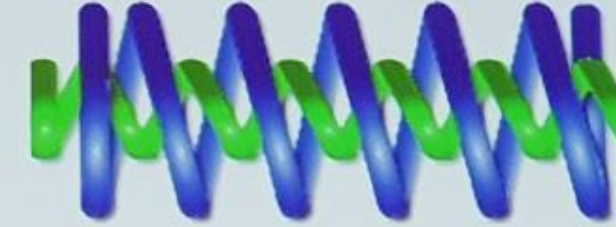
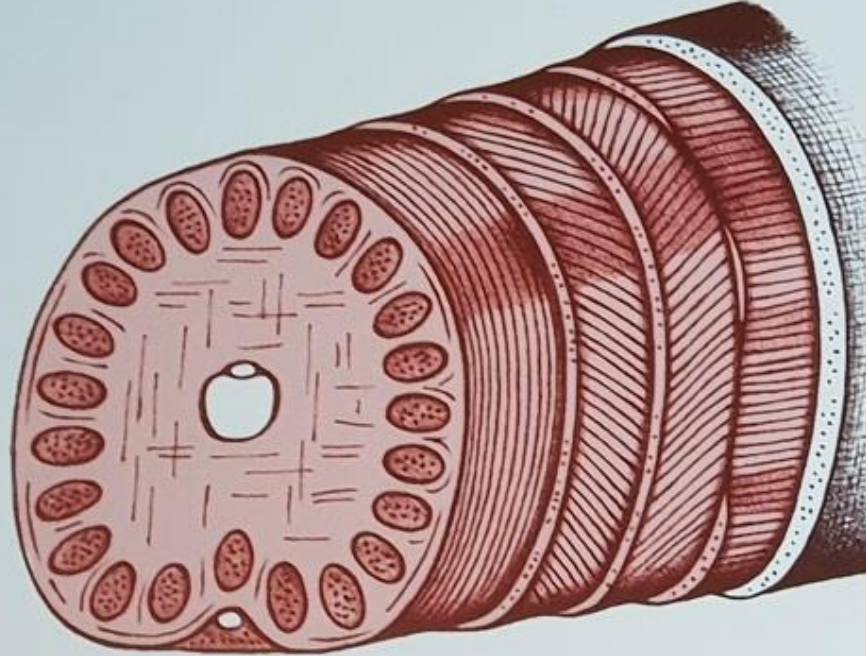


2. Complexity and Simplicity



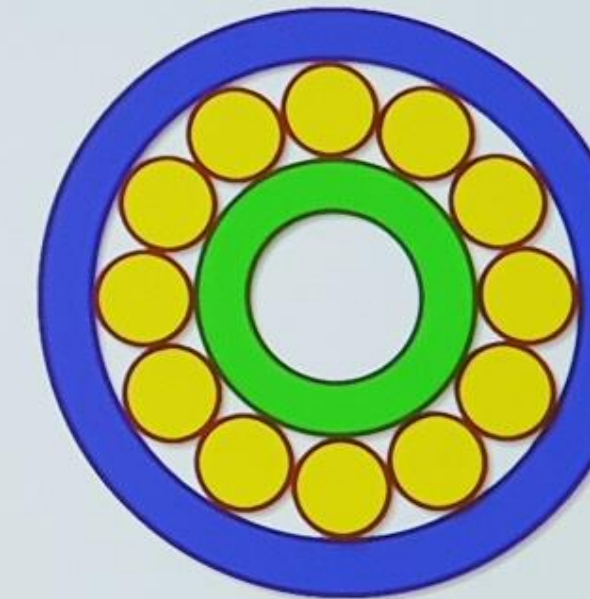
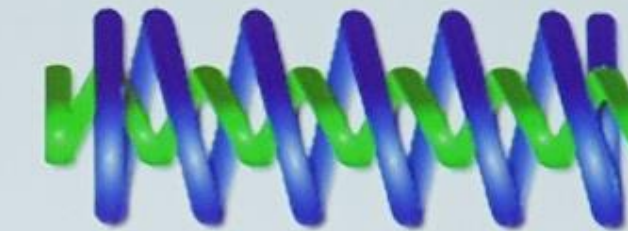
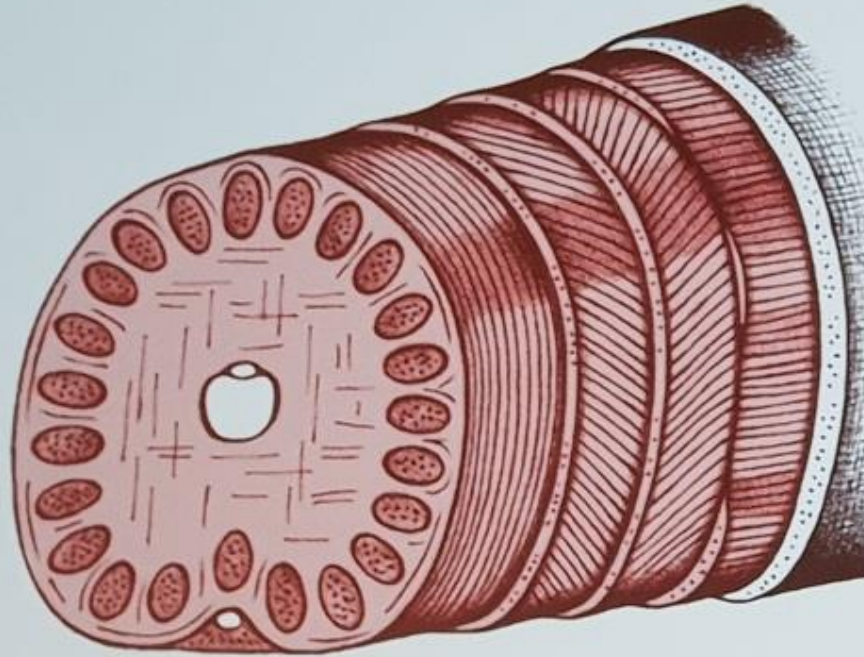


2. Complexity and Simplicity



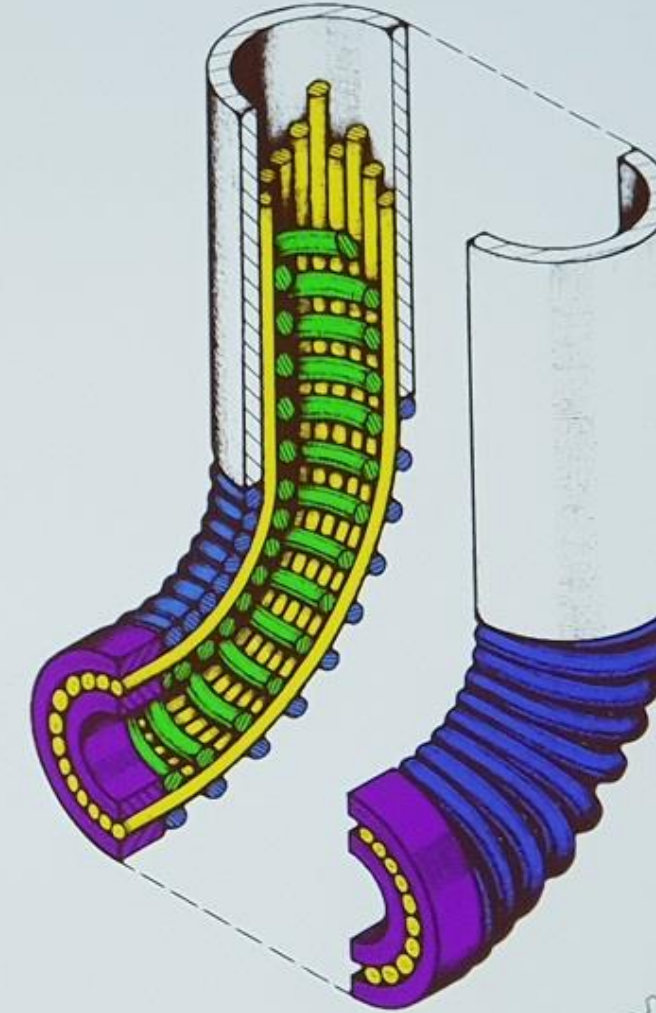
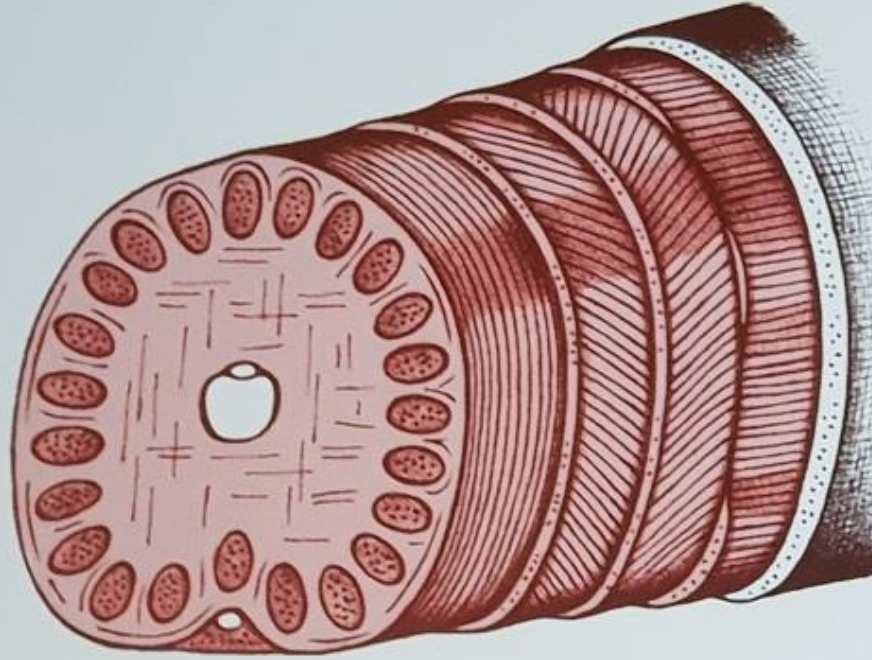


2. Complexity and Simplicity





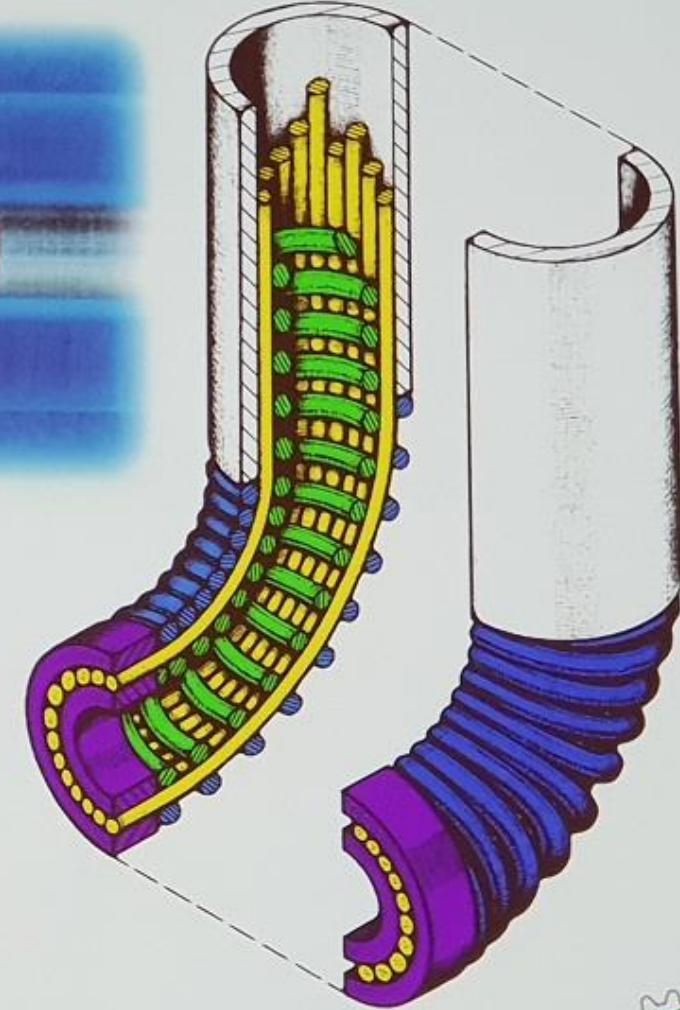
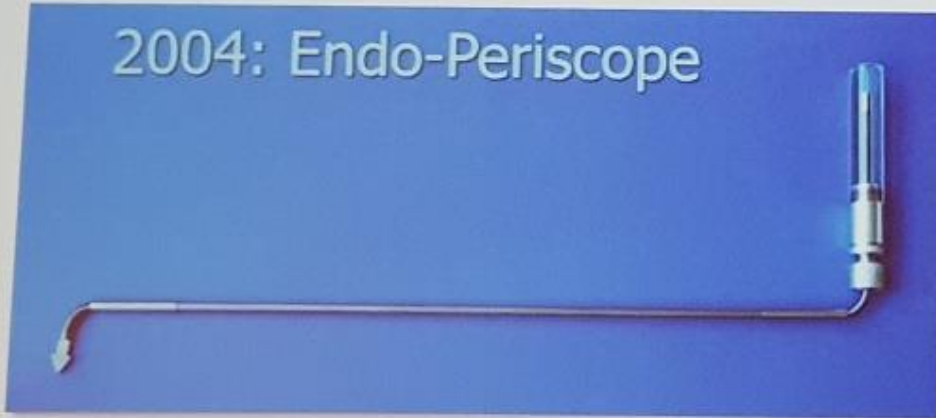
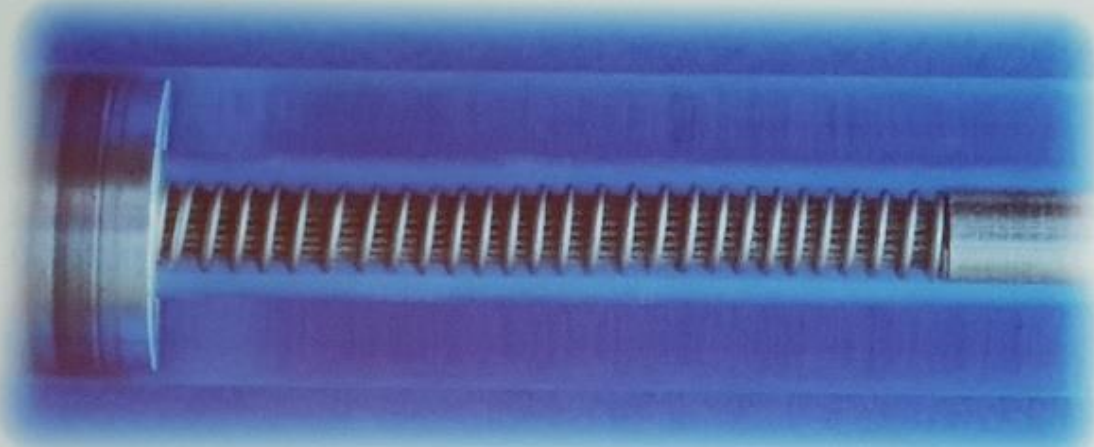
2. Complexity and Simplicity



Patented

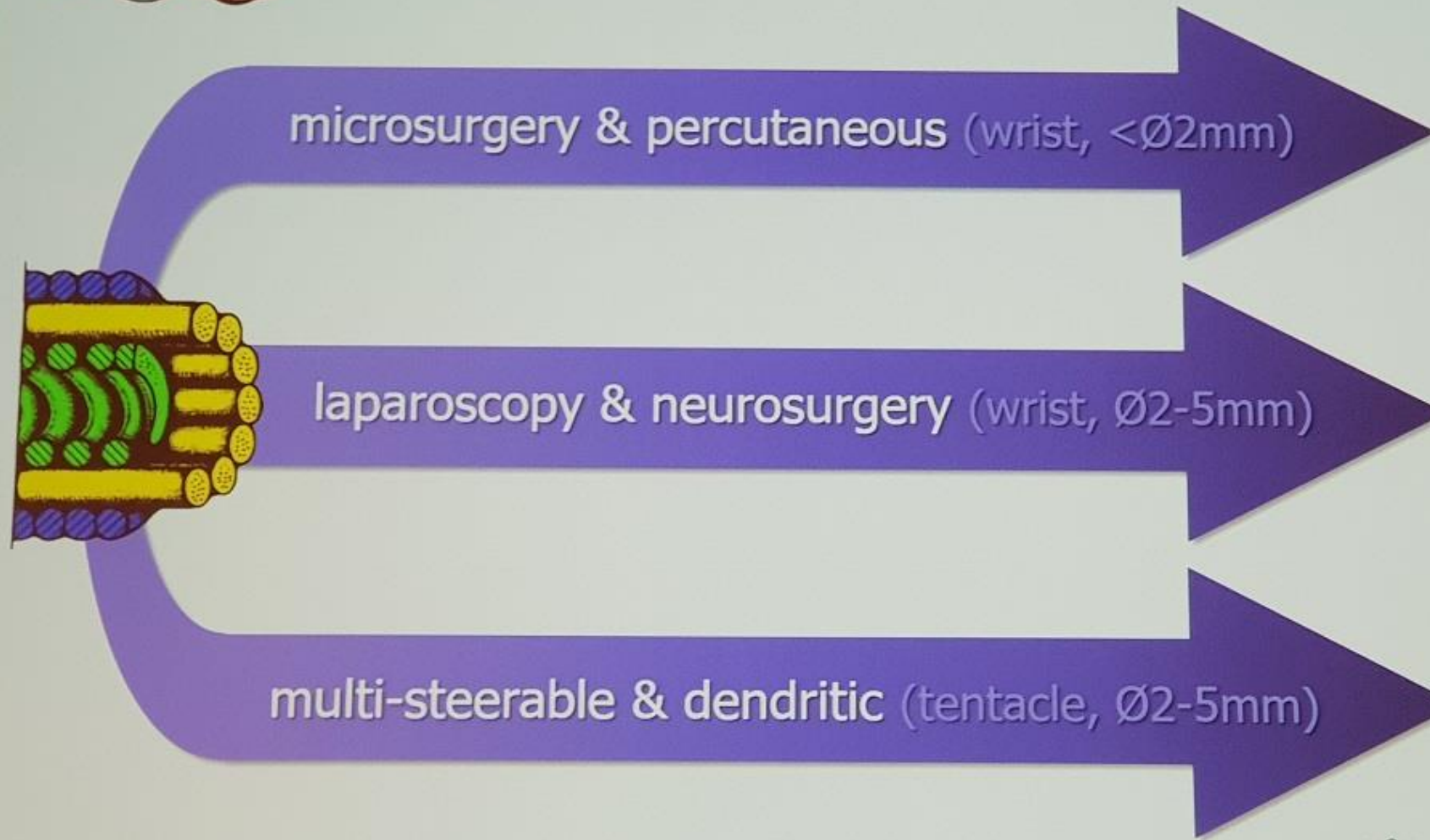


2. Complexity and Simplicity





2. Complexity and Simplicity



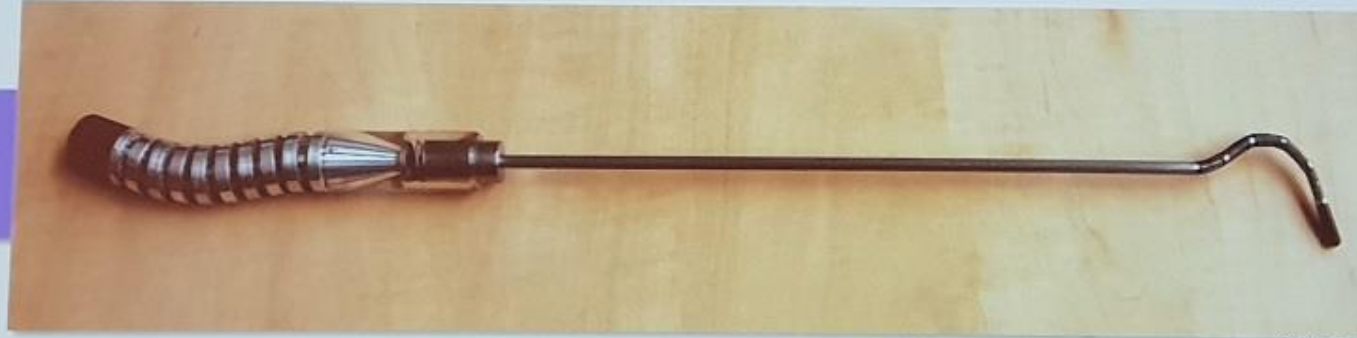
microsurgery & percutaneous (wrist, $< \varnothing 2\text{mm}$)

laparoscopy & neurosurgery (wrist, $\varnothing 2-5\text{mm}$)

multi-steerable & dendritic (tentacle, $\varnothing 2-5\text{mm}$)



2. Complexity and Simplicity





2. Complexity and Simplicity

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Optimal freedom of movement in the surgical area



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Our products

DEAM designs, produces and sells steerable laparoscopic instruments.

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Instruments with an ergonomic axial handle minimize strain for the surgeon.



LaproFlex

Steerable laparoscopic instrument with ergonomic axial handle

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LaproFix

Laparoscopic instrument with ergonomic axial handle

[View LaproFix](#)

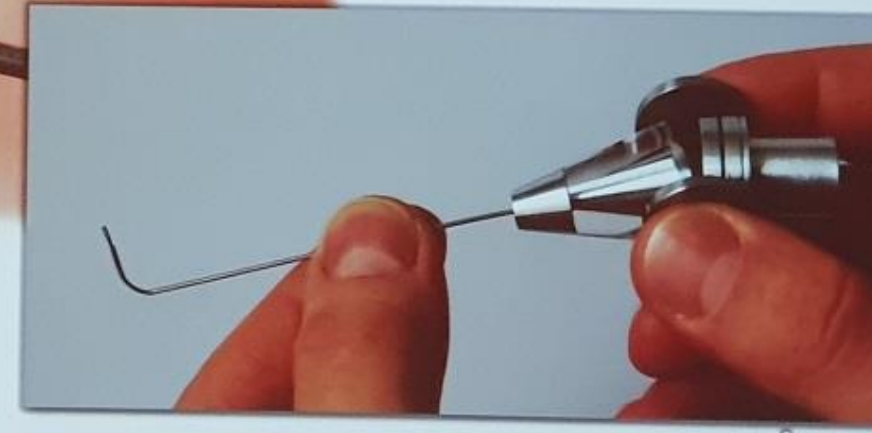




2. Complexity and Simplicity



2008: I-Flex





2. Complexity and Simplicity

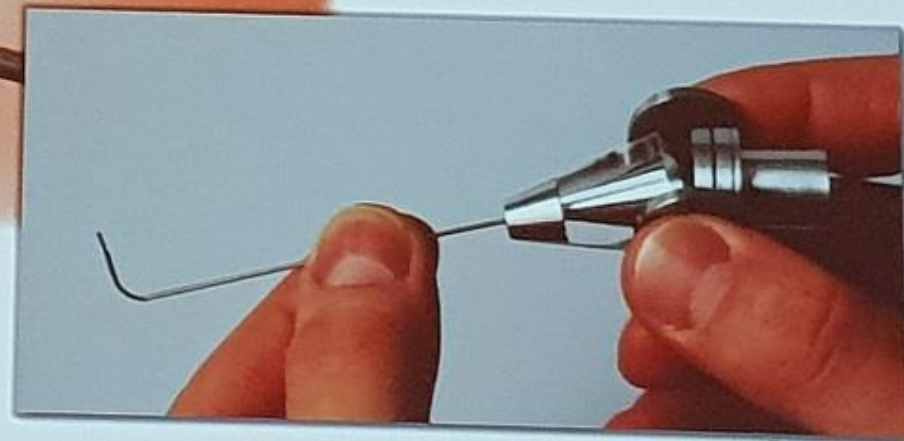
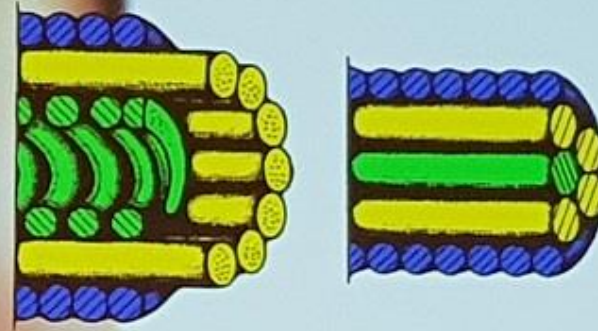
2008: I-Flex





2. Complexity and Simplicity

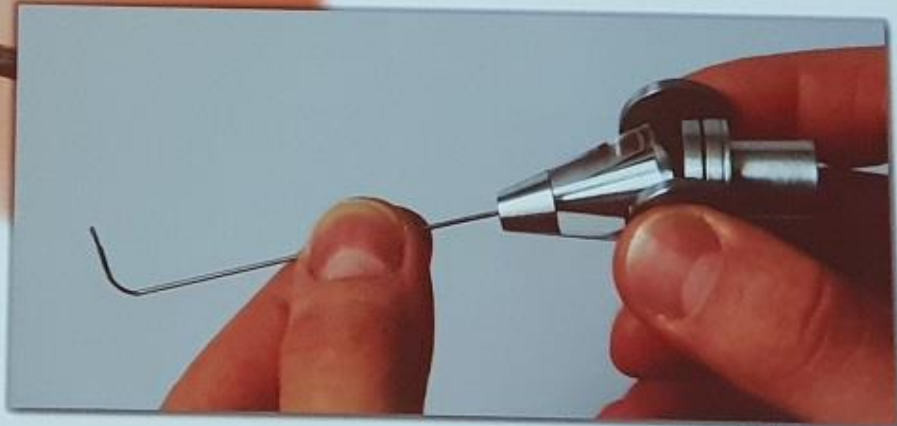
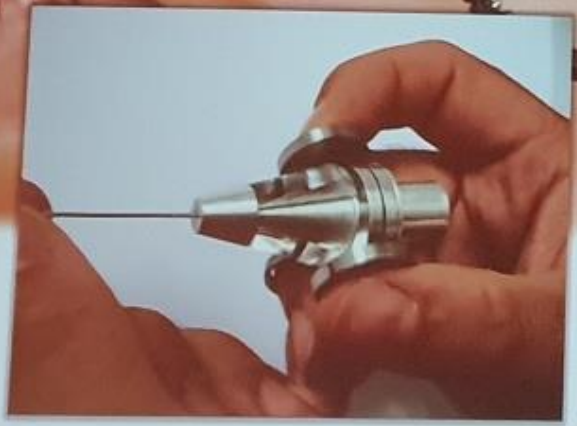
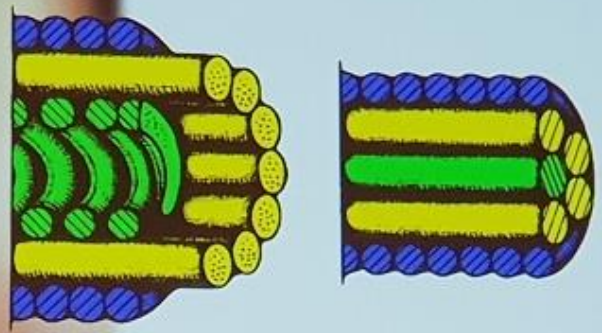
2008: I-Flex





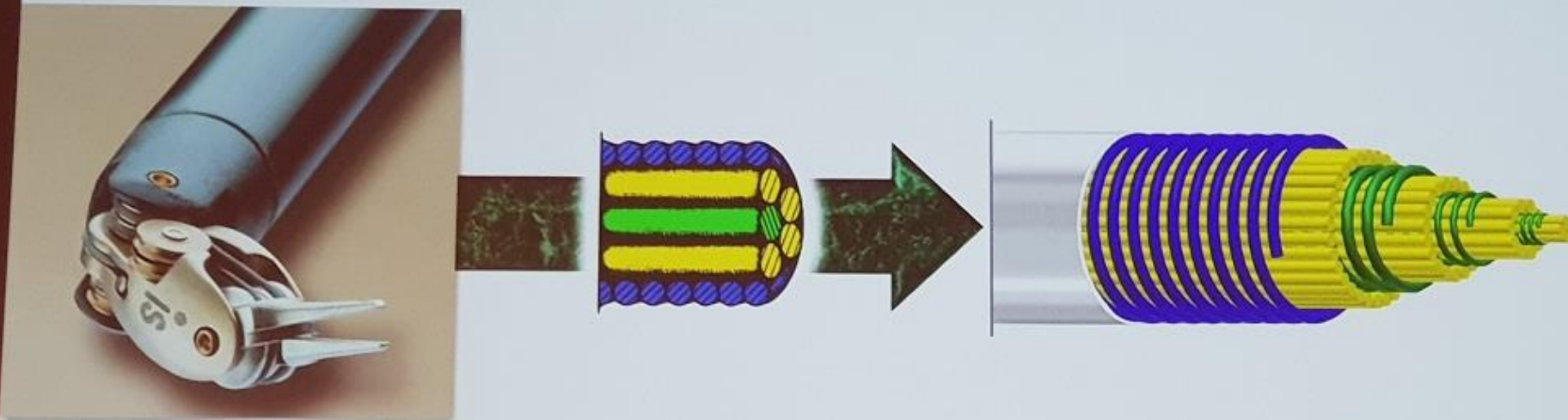
2. Complexity and Simplicity

2008: I-Flex



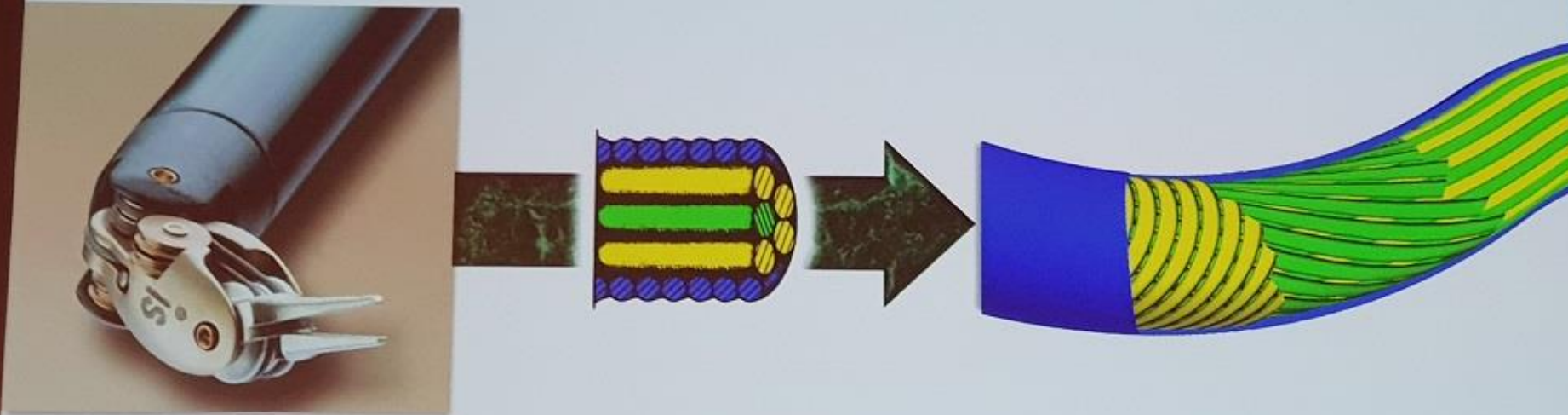


2. Complexity and Simplicity



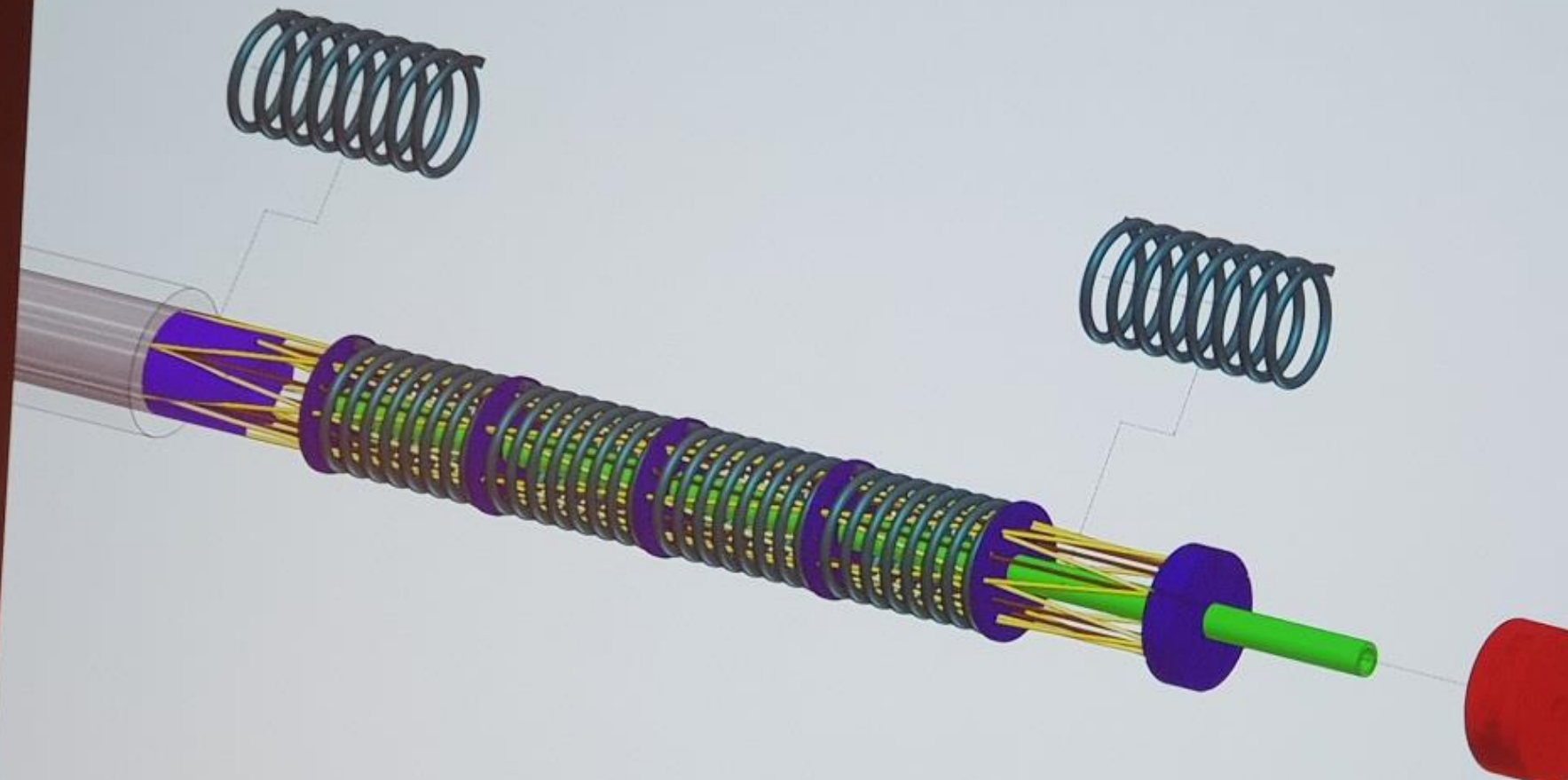


2. Complexity and Simplicity





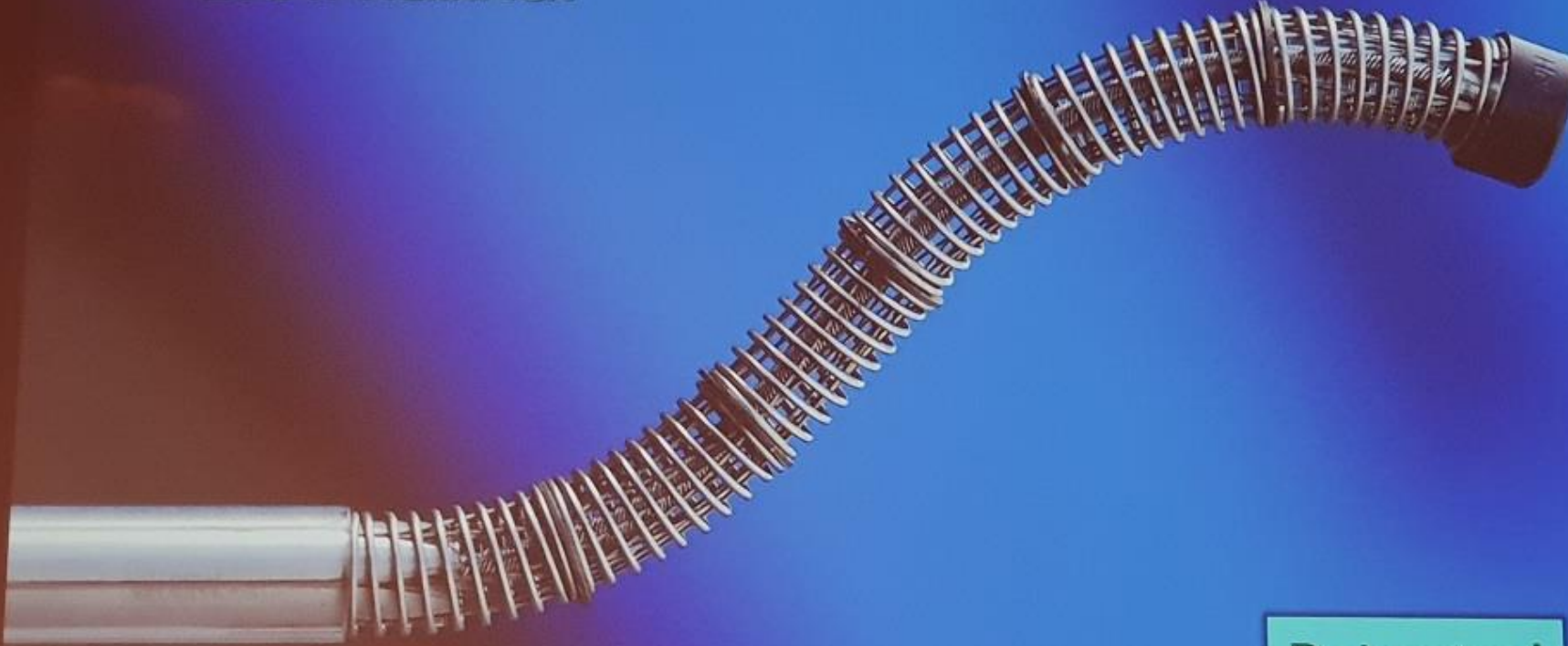
3. Maneuvering like a Snake





3. Maneuvering like a Snake

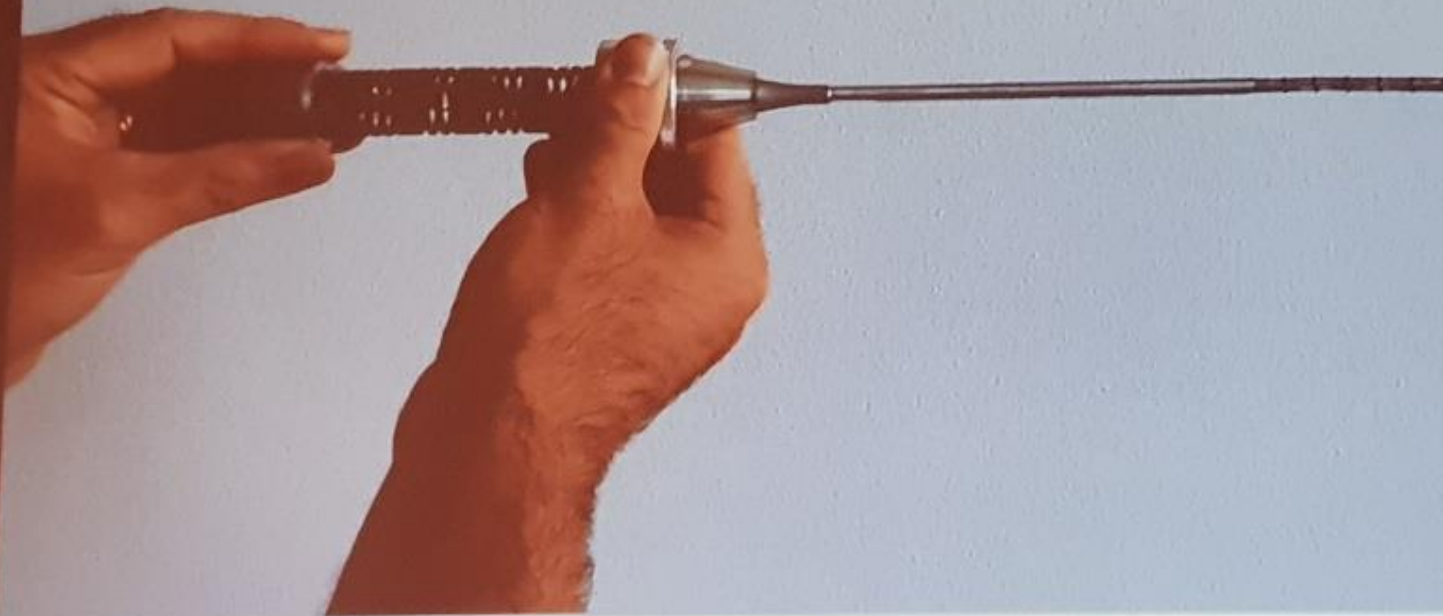
2014: HelixFlex



Patented



3. Maneuvering like a Snake





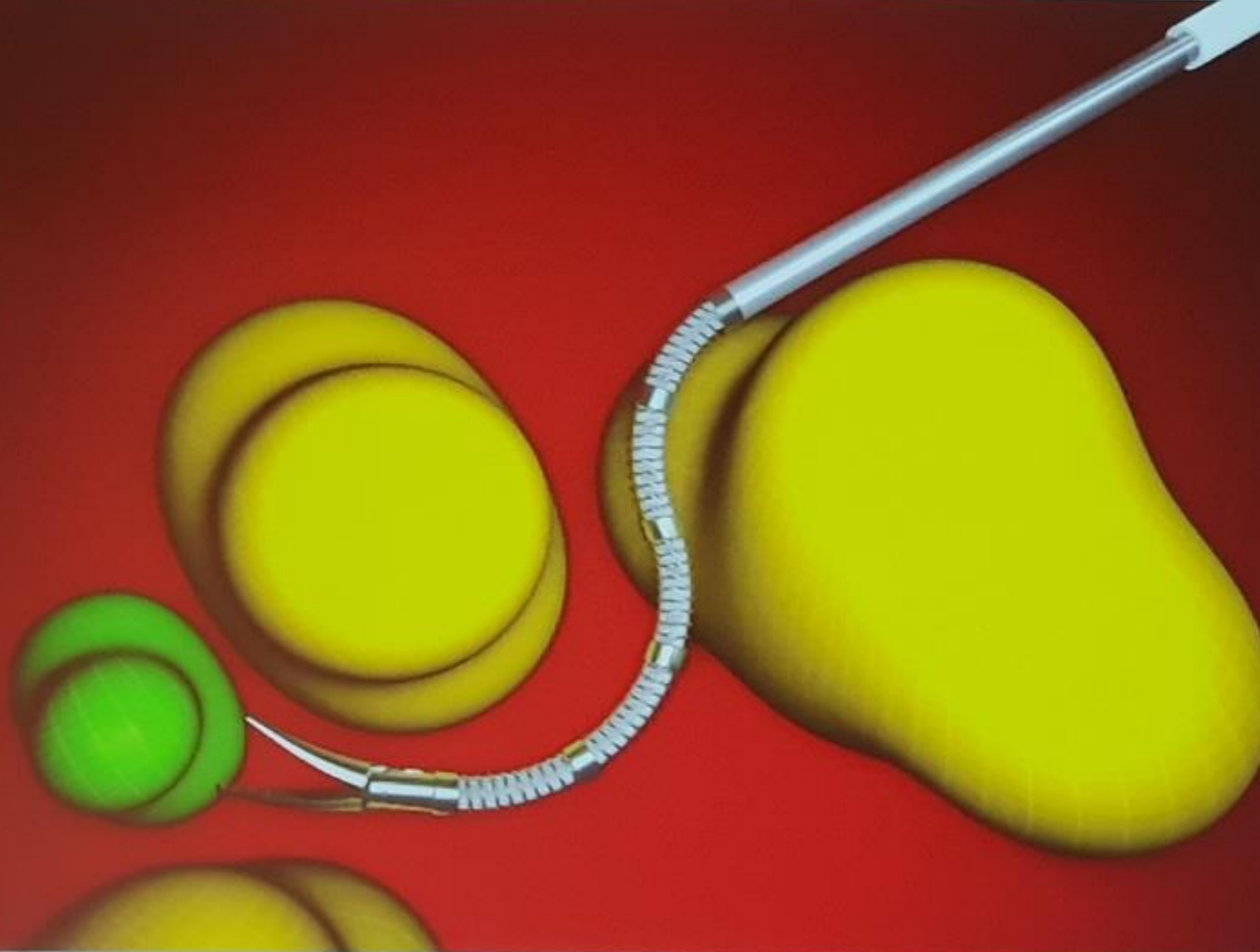
3. Maneuvering like a Snake



2008: MultiFlex



3. Maneuvering like a Snake



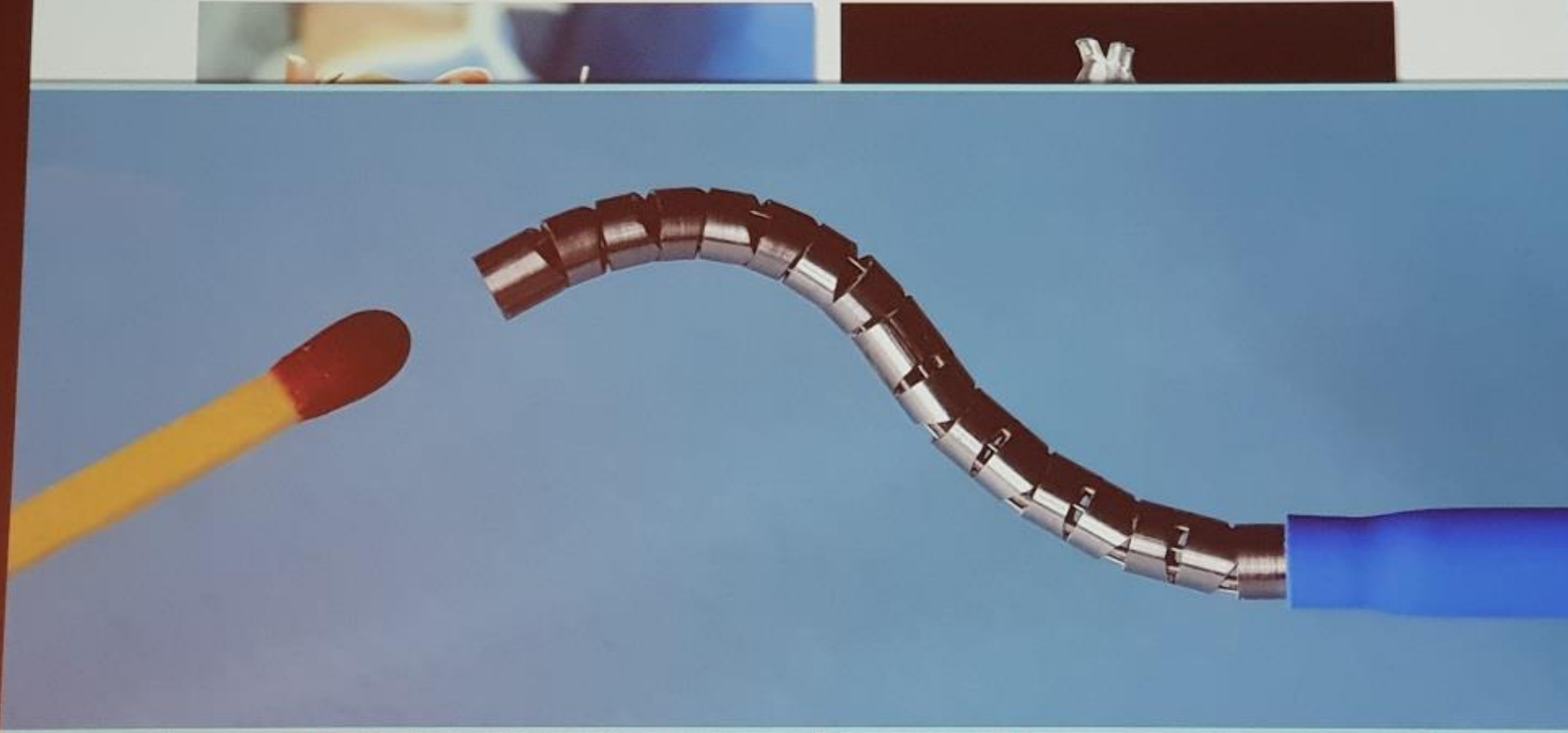


3. Maneuvering like a Snake





3. Maneuvering like a Snake





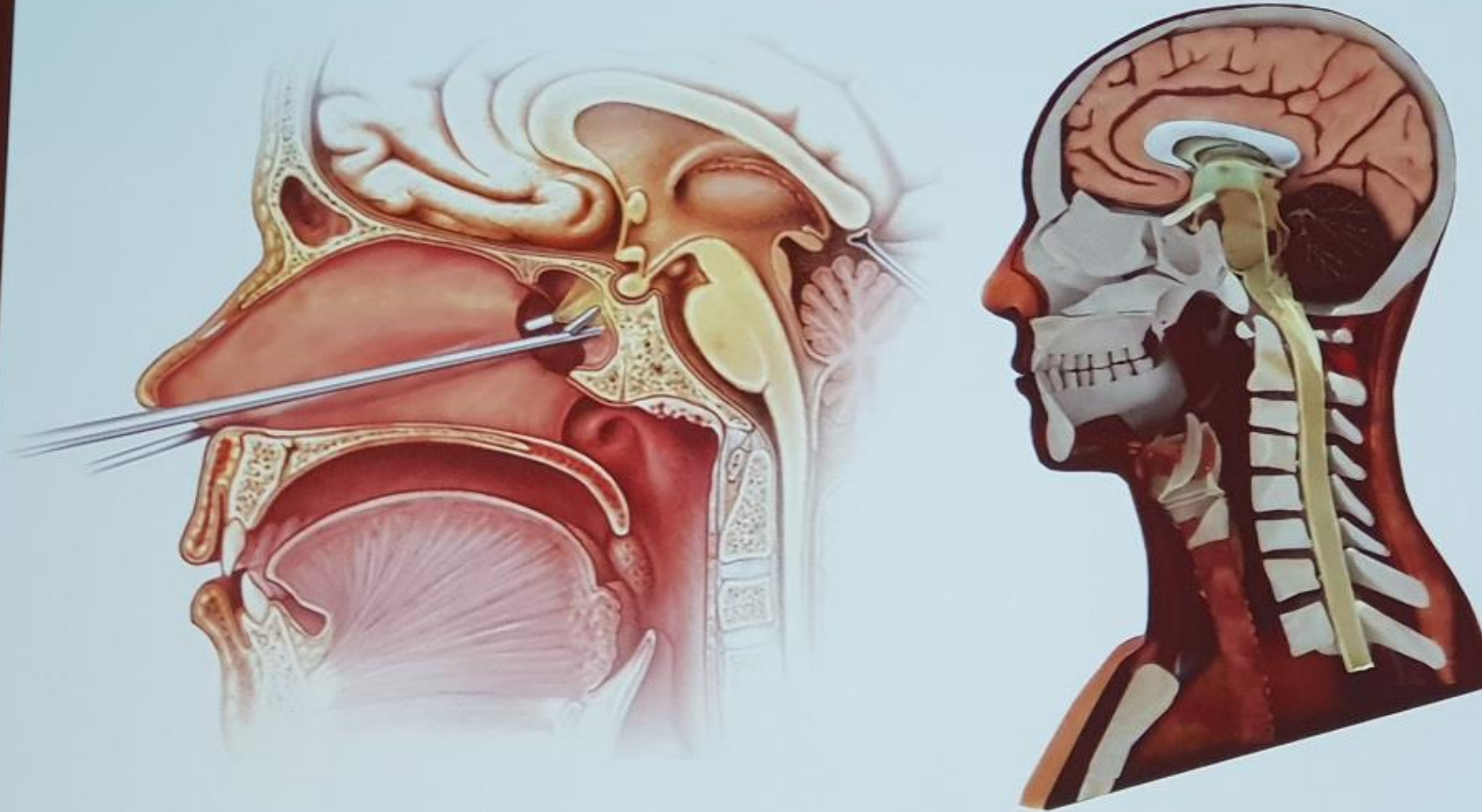
3. Maneuvering like a Snake

2016: MemoFlex



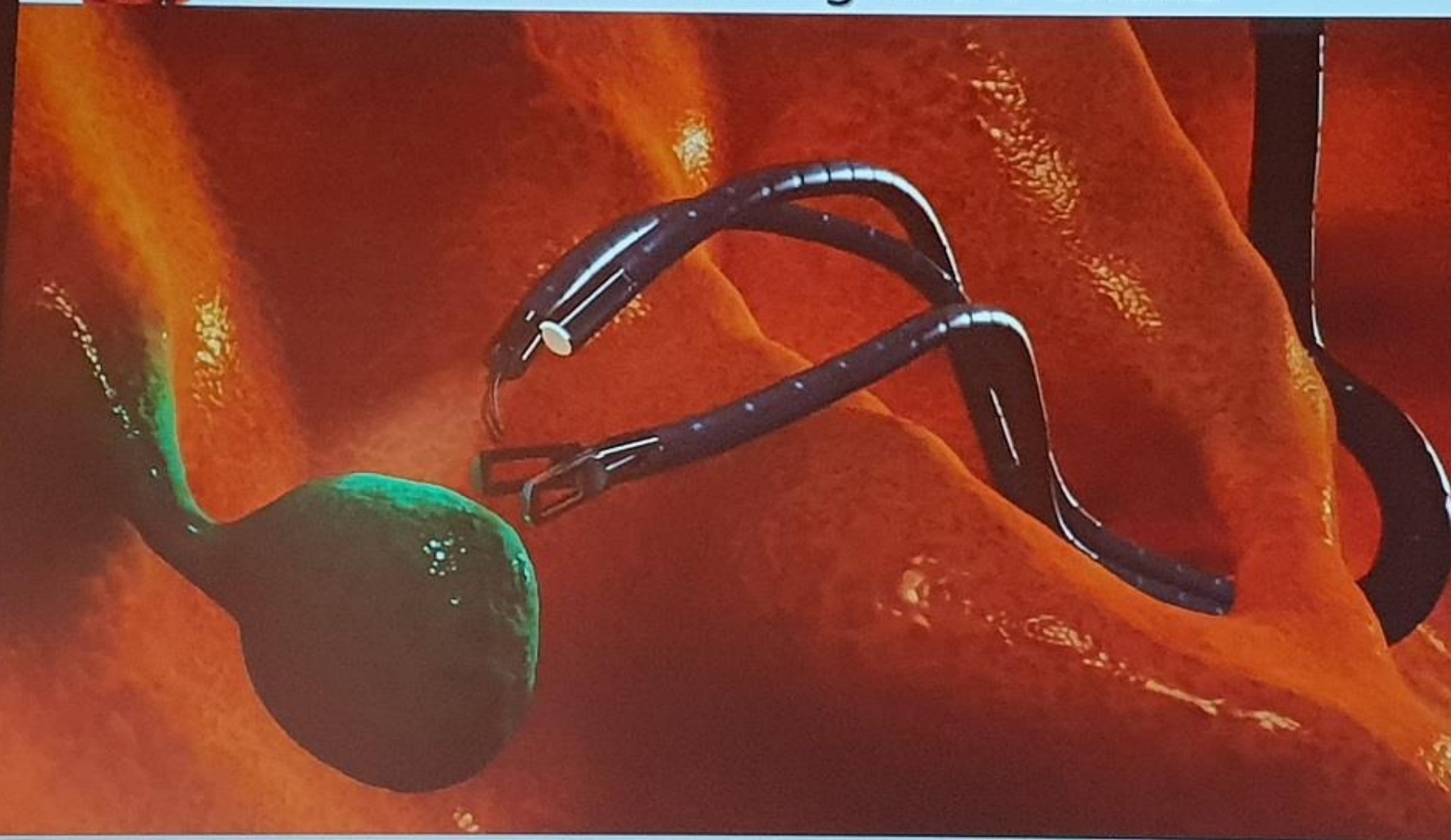


3. Maneuvering like a Snake



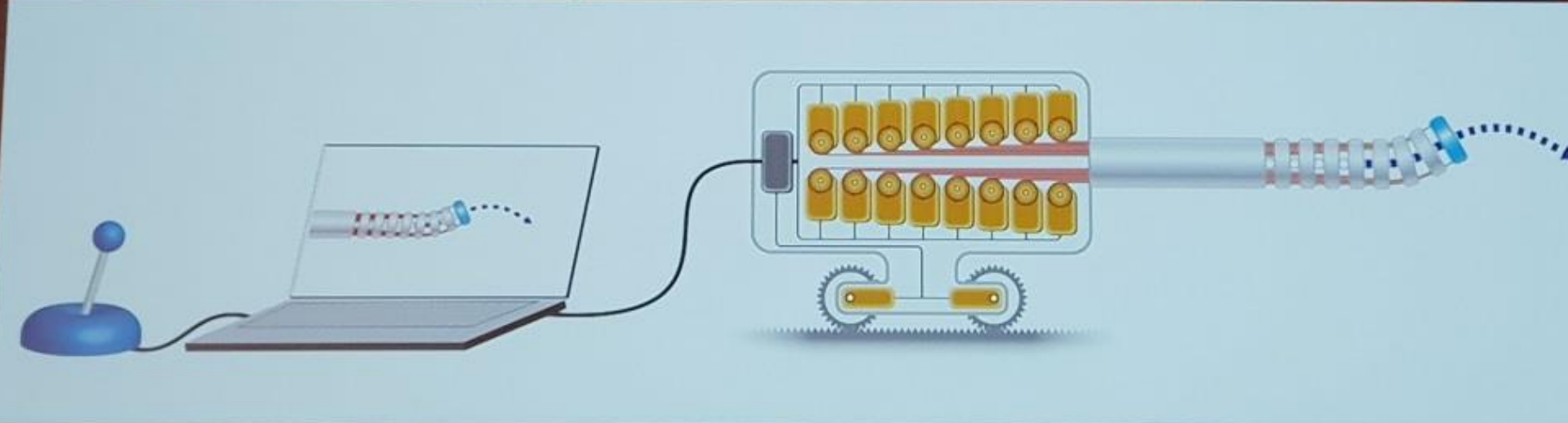


3. Maneuvering like a Snake



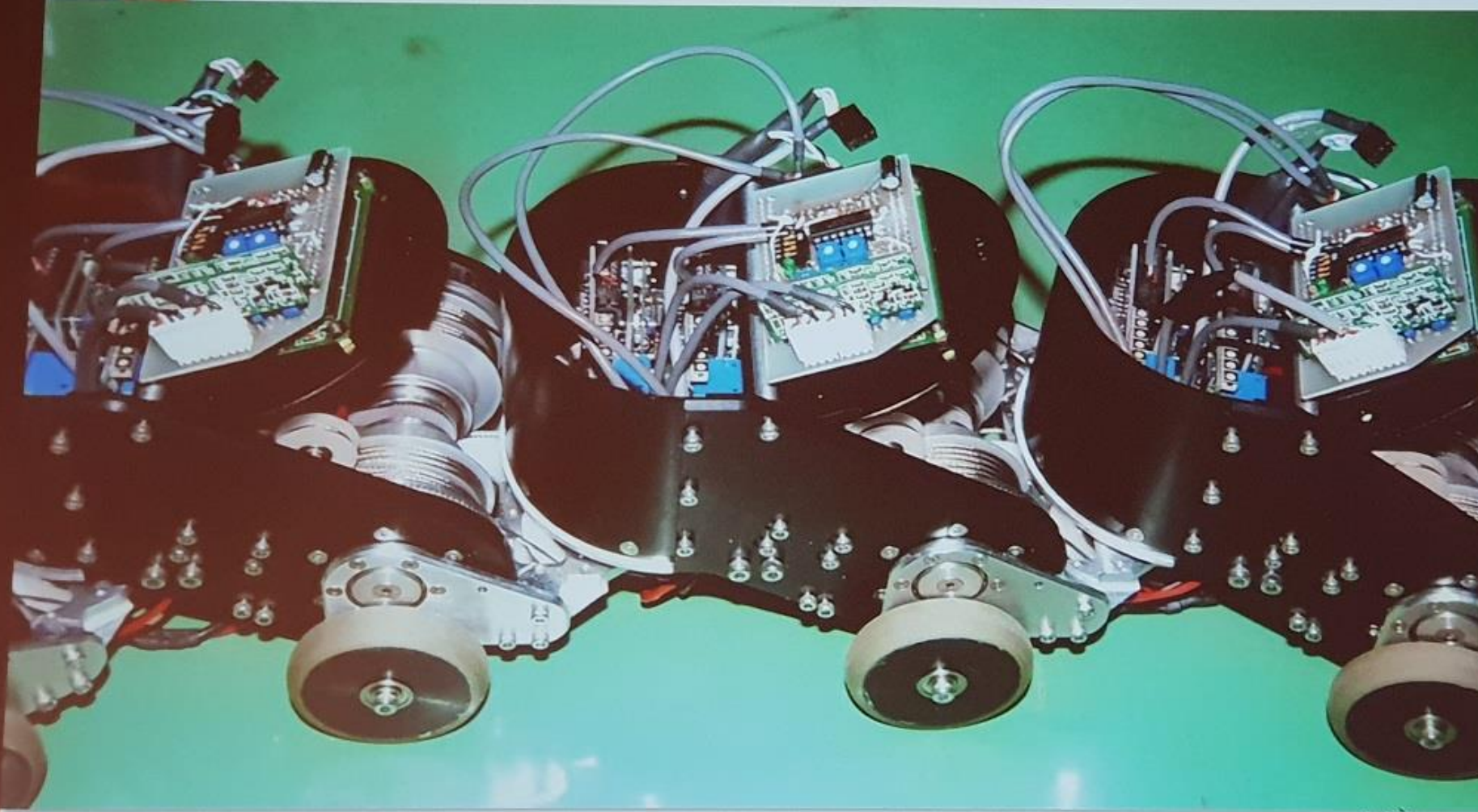


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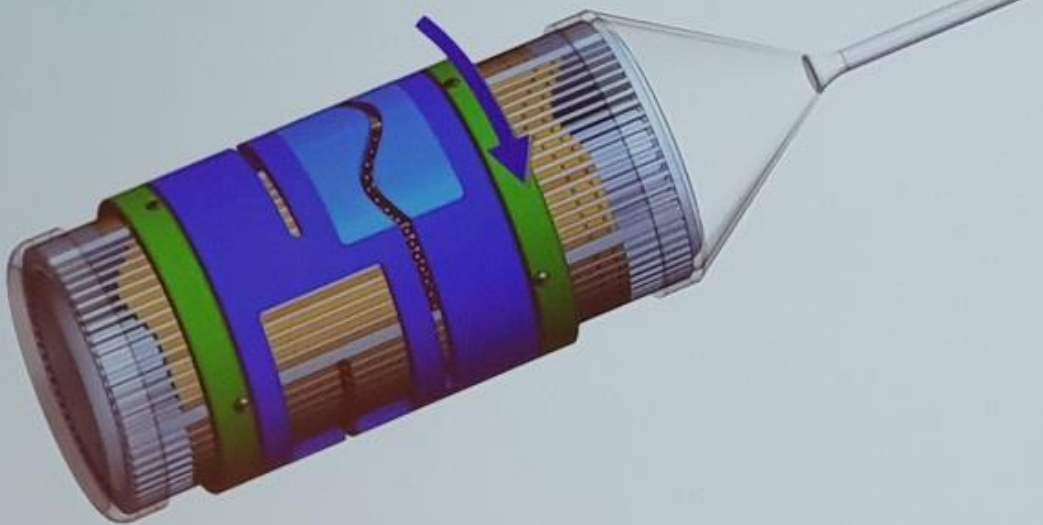


3. Maneuvering like a Snake





4. Mechanizing the Snake



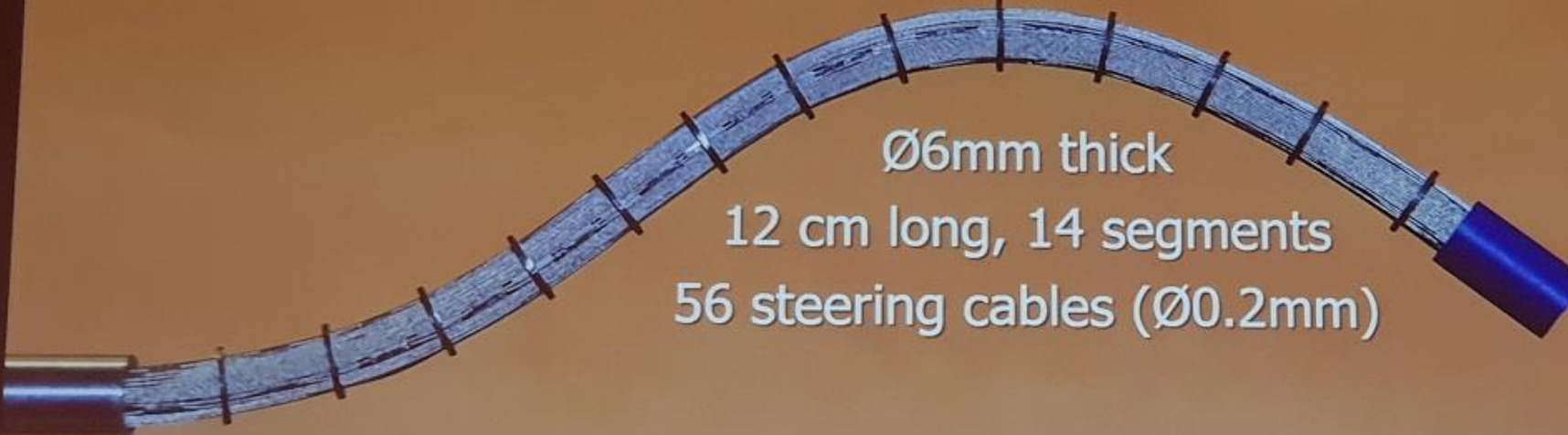


4. Mechanizing the Snake





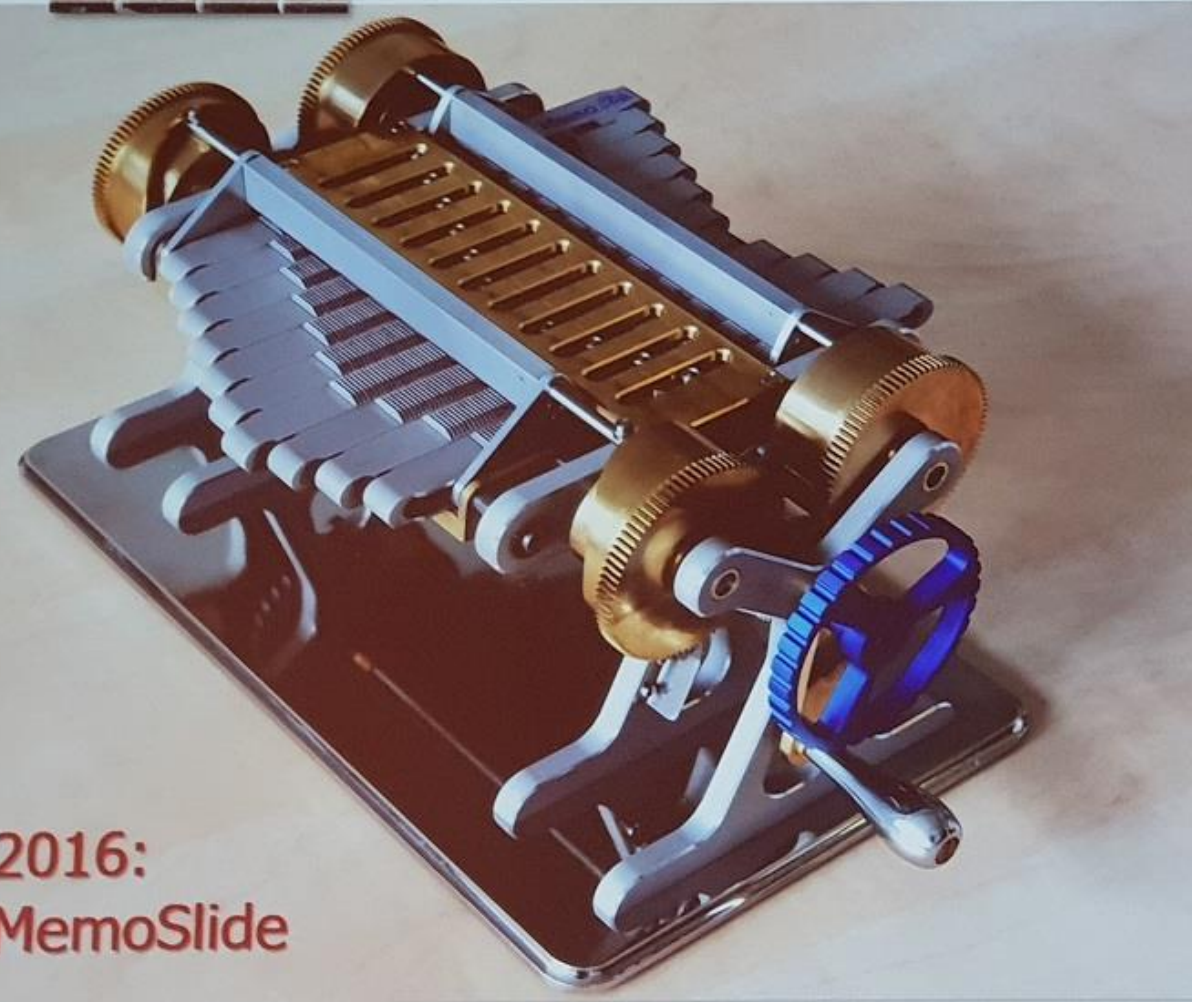
4. Mechanizing the Snake



Ø6mm thick
12 cm long, 14 segments
56 steering cables (Ø0.2mm)



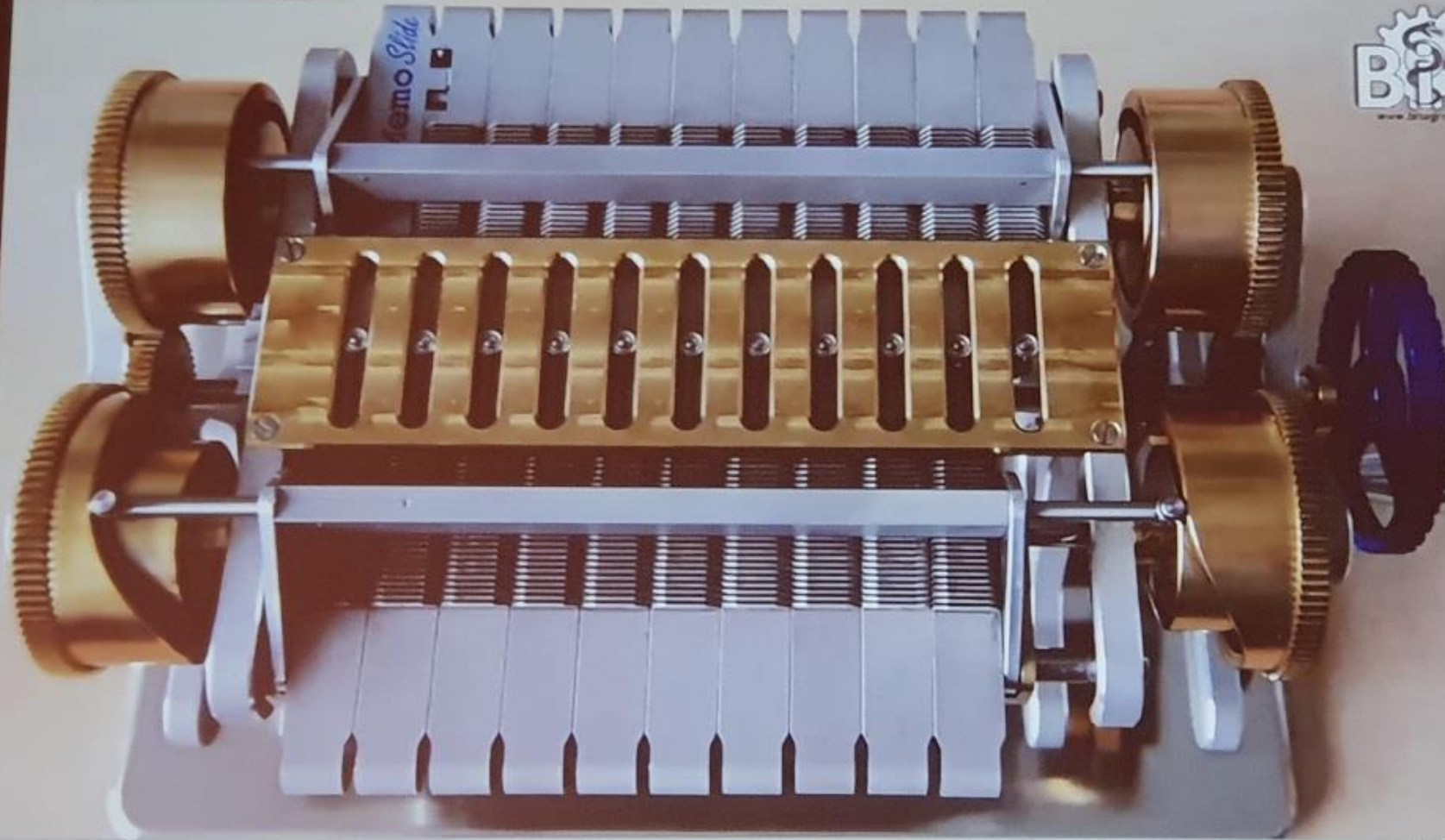
4. Mechanizing the Snake



2016:
MemoSlide

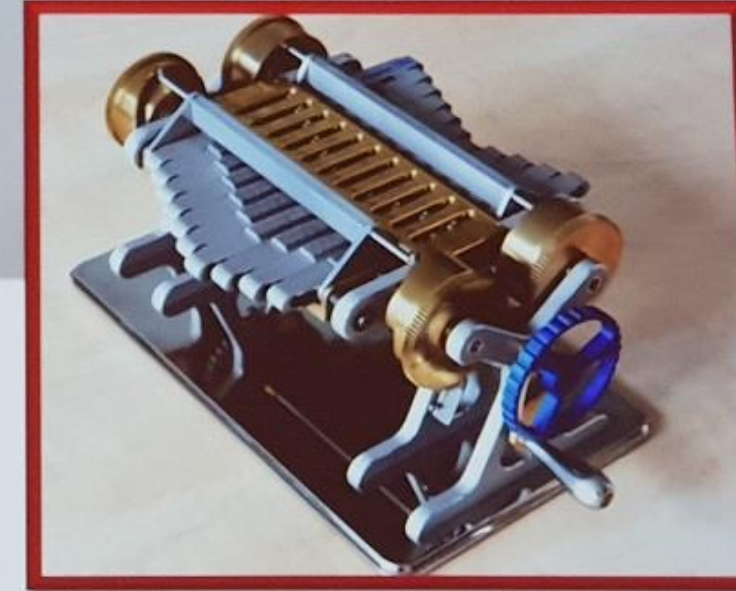
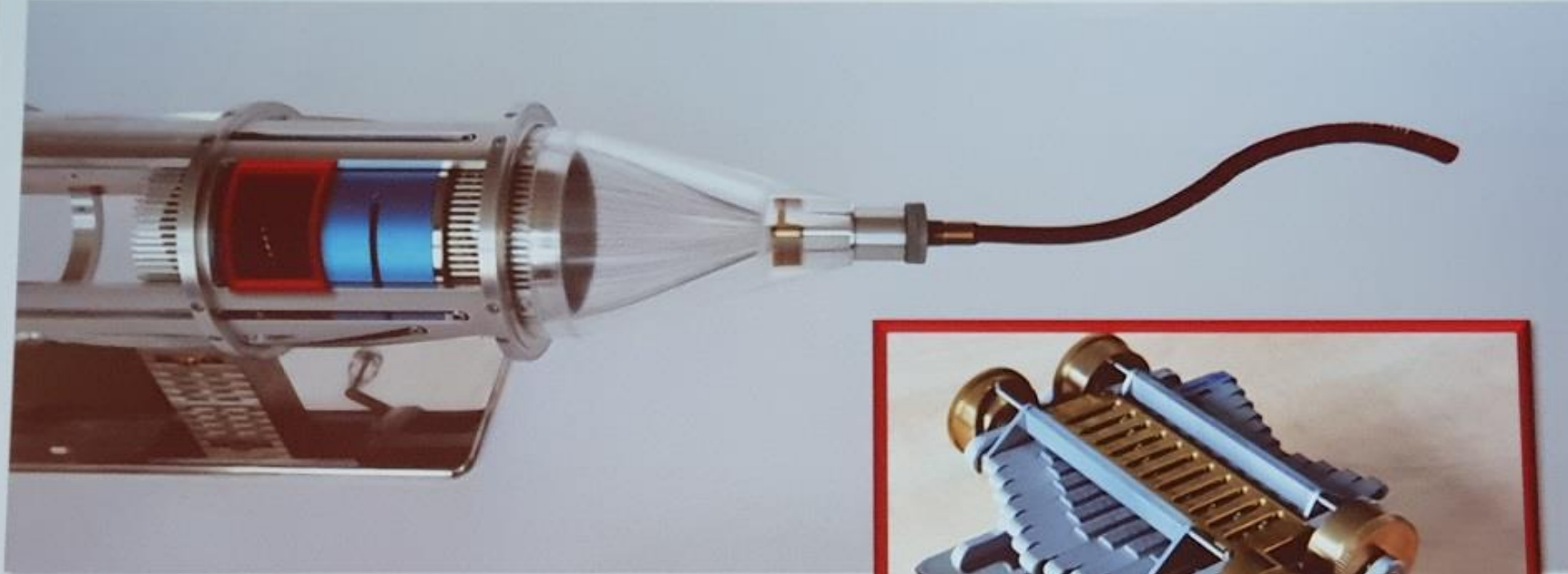


4. Mechanizing the Snake



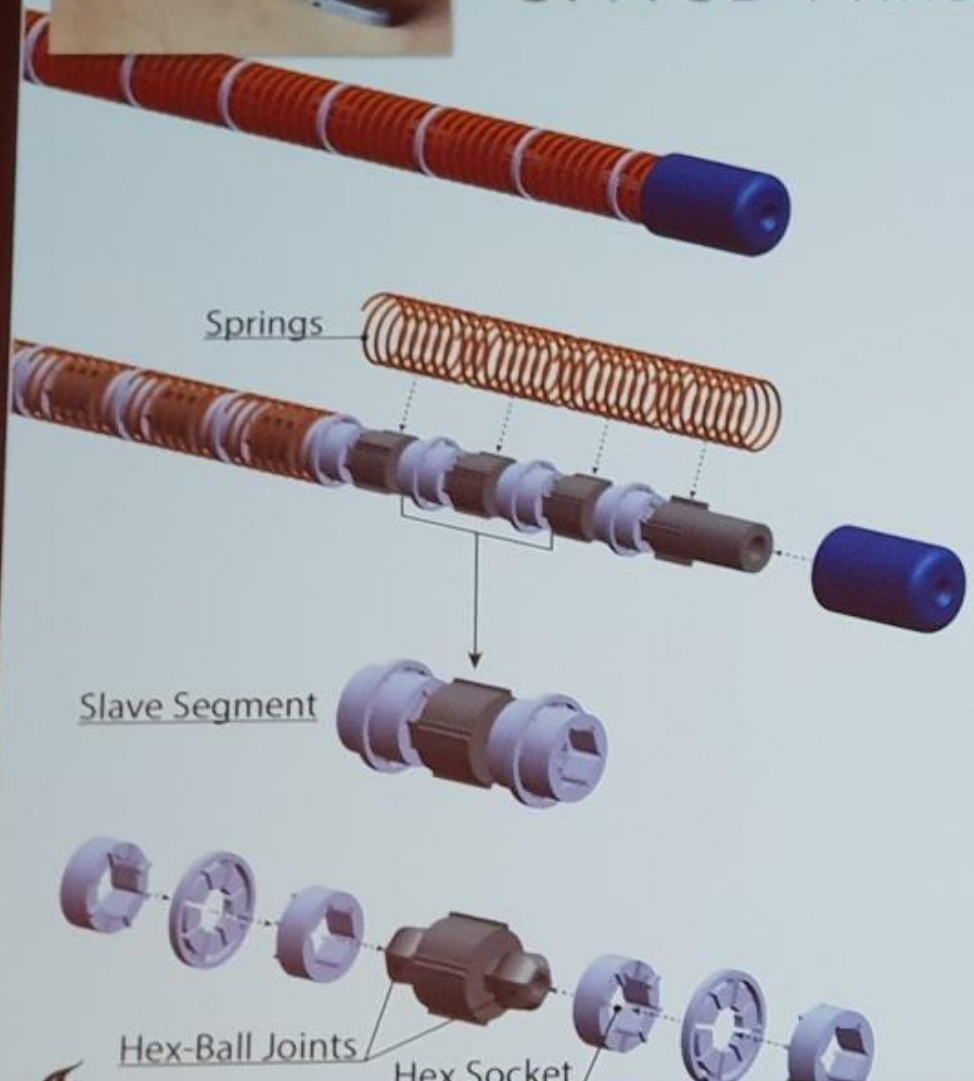


4. Mechanizing the Snake



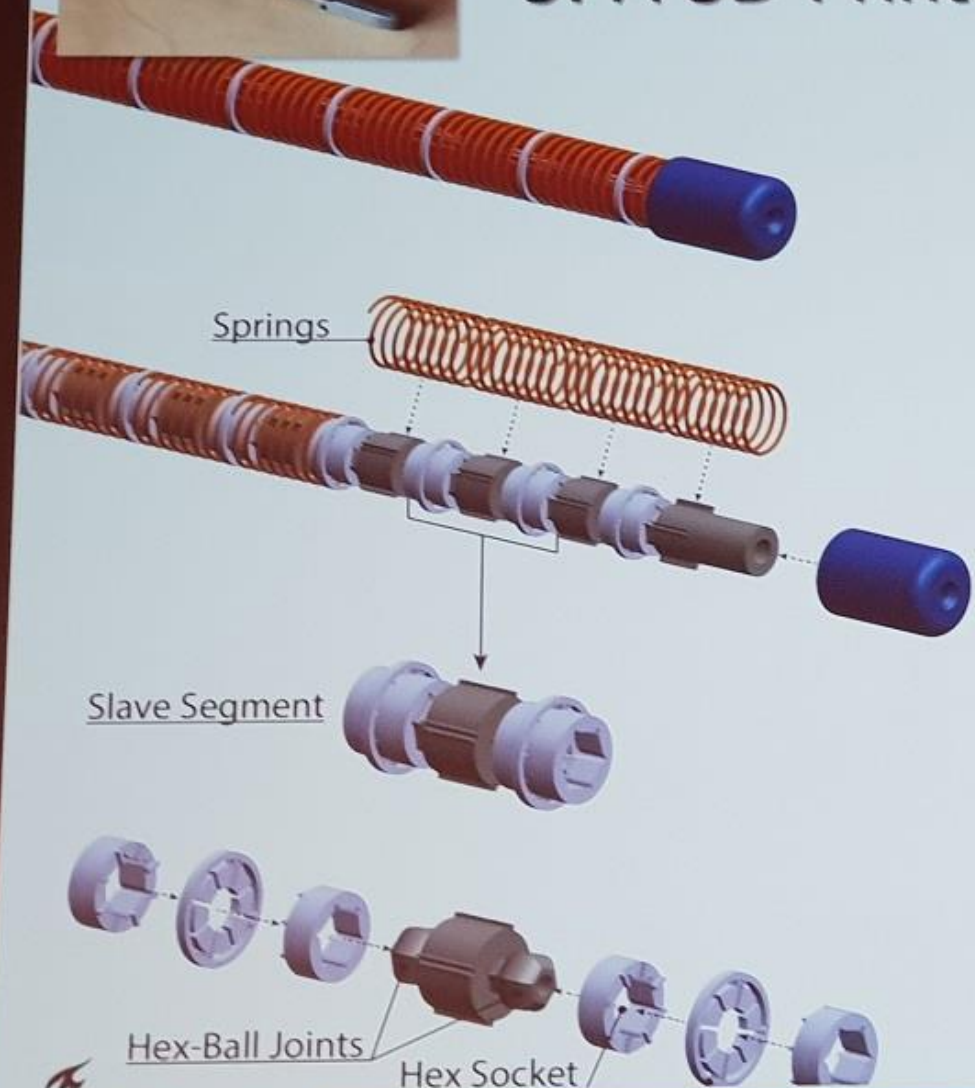


5. A 3D Printed Future?

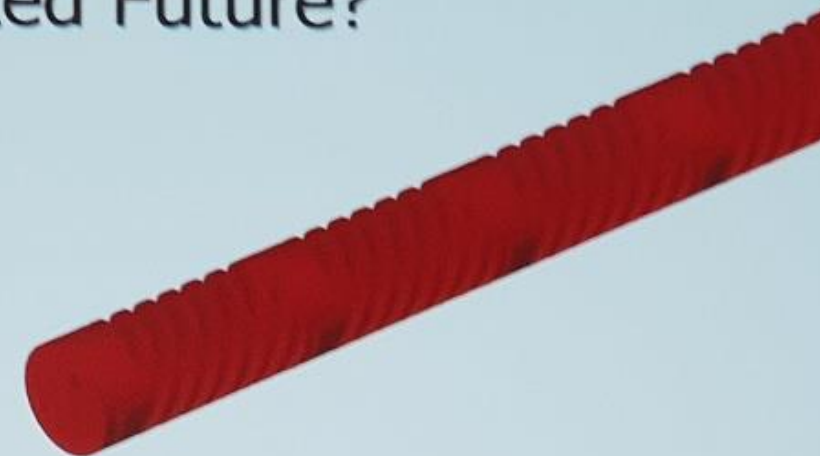




5. A 3D Printed Future?



Printed Future?





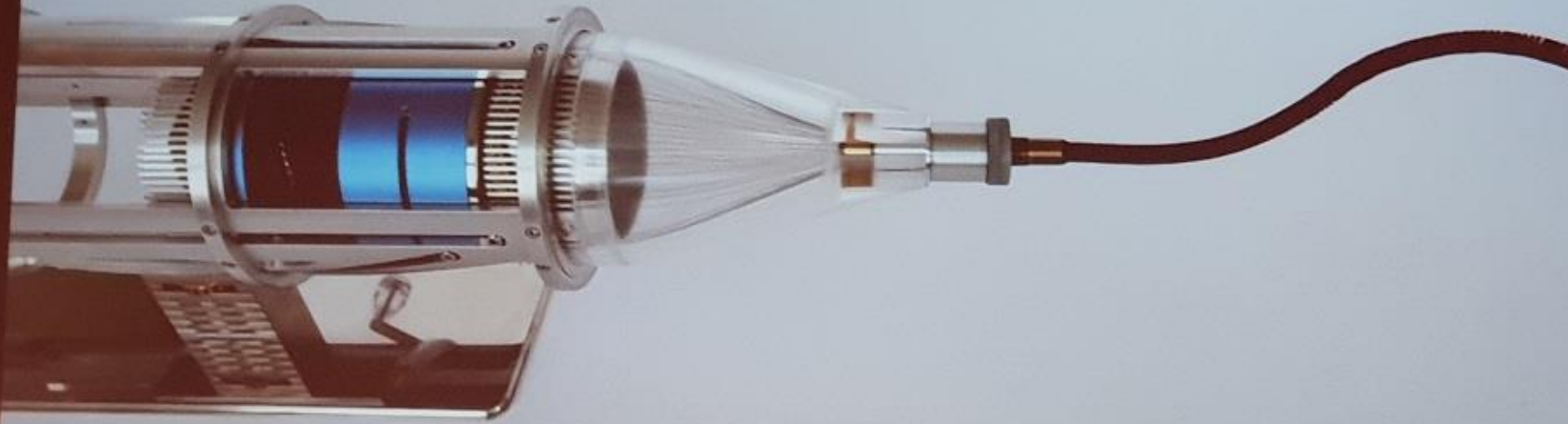
5. A 3D Printed Future?



After 4000 years of circles & cylinders
we now have to twist to a new design mindset



5. A 3D Printed Future?



After "4000" years of cleaning after designing
we now have to integrate cleaning with designing!