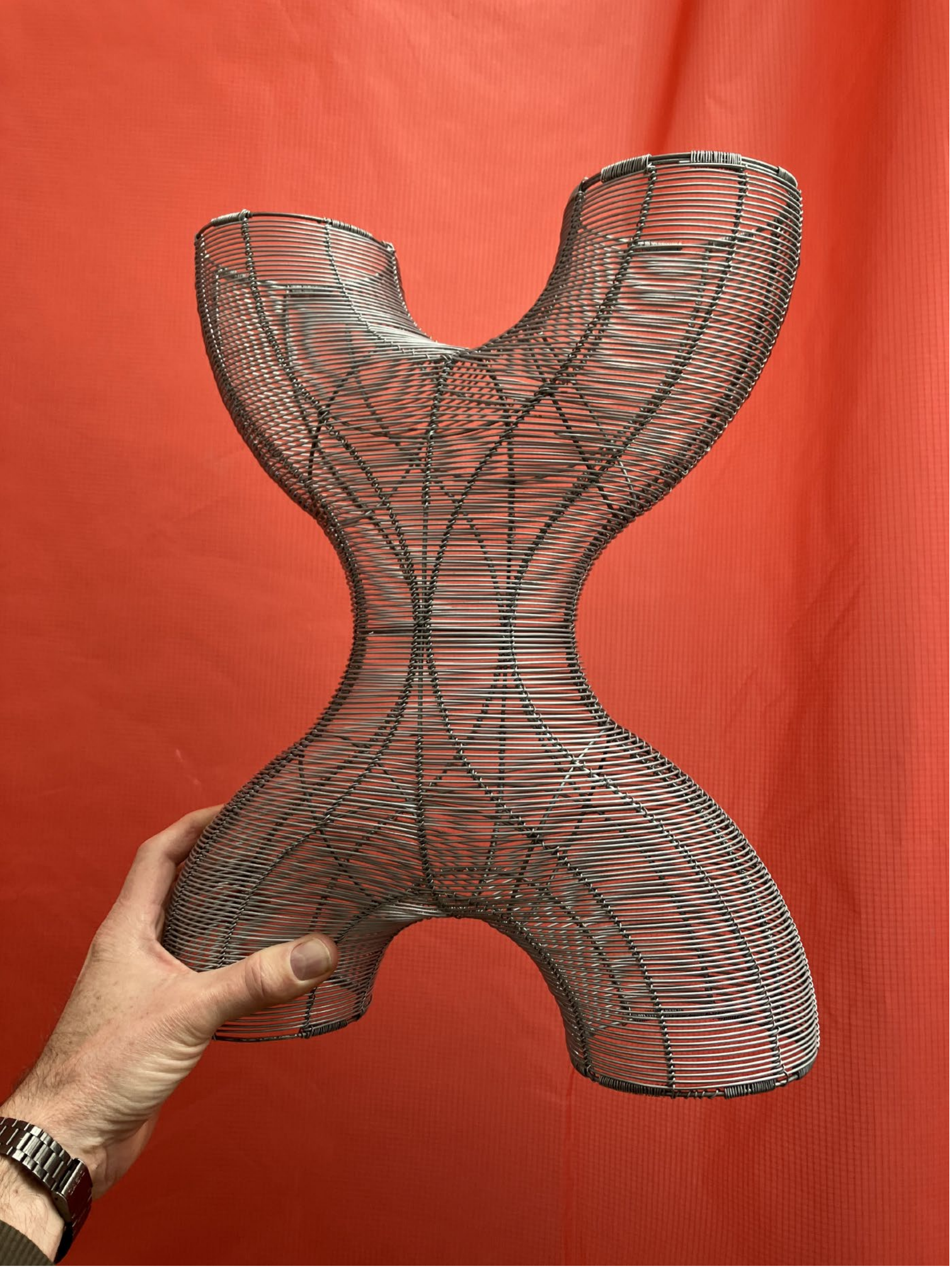
HOT MESH

African Robots &
SPACECRAFT

Ralph Borland Studio
2024

African Robots & SPACECRAFT is rooted in the intersection of digital and hand wireframe construction - an aesthetic symbol of the meeting of human and machine. It is the meeting point of vernacular street craft with fine art and design using cutting edge tools and technologies. We have an Afropolitan ethos with a global perspective, and combine social sculpture with social enterprise. Hot Mesh is our latest project.



An individual
Hot Mesh
X-module
2024

Hot Mesh is the latest African Robots & SPACECRAFT project from Ralph Borland Studio. It continues our exploration of sensuously entangled three-dimensional forms in wire, realised through a combination of hand and machine processes, that characterises our recent commission for the Gorgeous George Hotel in Cape Town, **Shapeshifting Chandelier**.

As in that work, launched in November 2023, finely constructed forms in galvanised steel wire are the result of hundreds of hours of intensive hand craft by skilled artisans working with lead artist Ralph Borland, based on sculptural exploration in a combination of digital modelling, Virtual Reality visualisation, and clay maquettes.

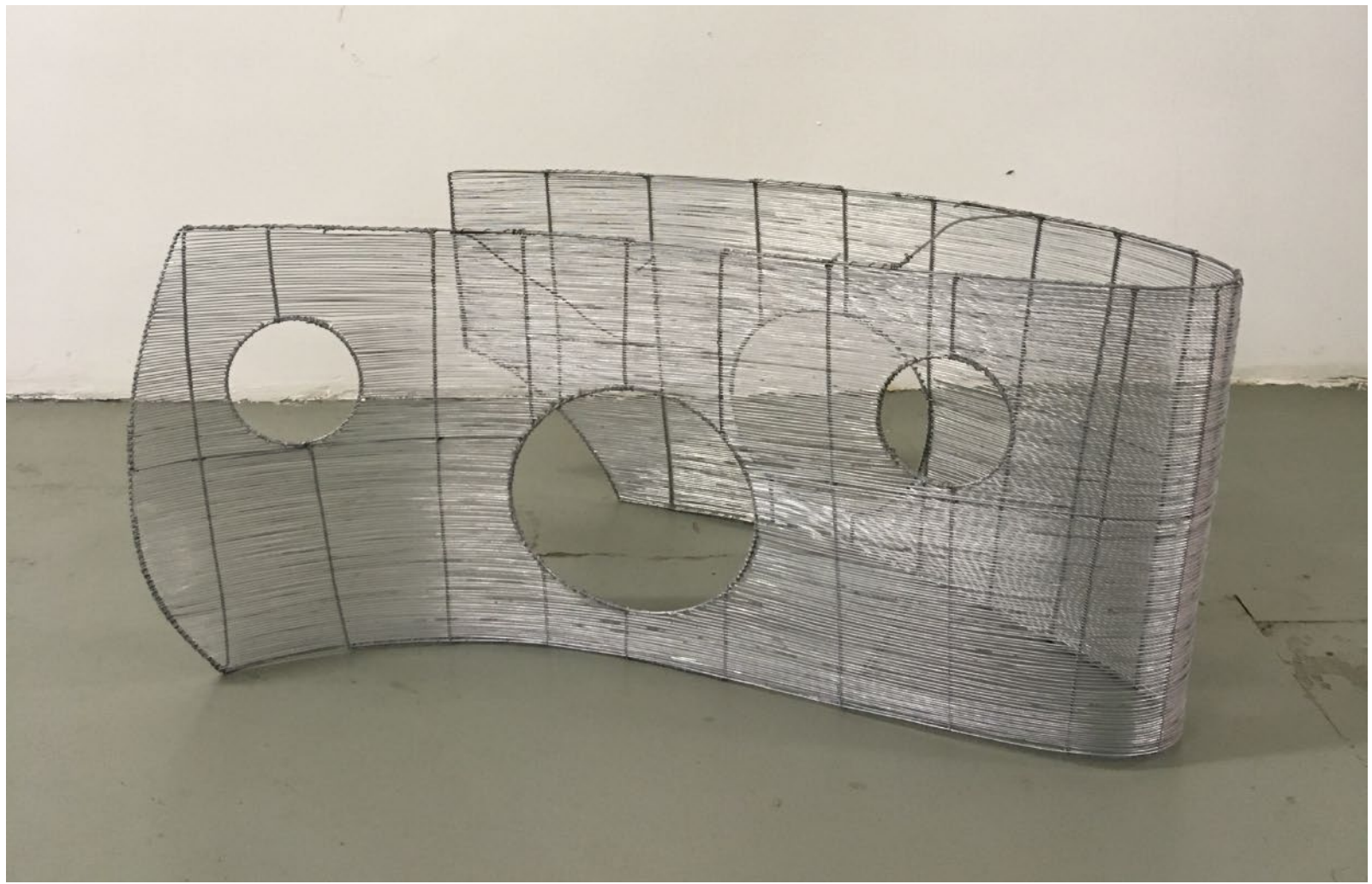
Shapeshifting Chandelier
2023

Wire artist Kelvin Dube working on **Shapeshifting Chandelier**

Our use of handwoven skins over our distinctive precision wireframe work began in earnest with our monumental interactive sculpture project **Dubship I - Black Starliner** (2019 - 2022), now in the collection of Ibrahim Mahama at Red Clay Studios in Ghana.

Dubship I, launched in 2019 at Africa's largest contemporary art museum, the Zeitz MoCAA, with support from South Africa's National Arts Council, consists of a steel frame and galvanised steel wire skin. It contains an electromechanical dub sound system.

When we exhibited the sculpture in pieces for our Covid-era show **Exploded View**, my attention was drawn to the beauty of the individual panels making up the skin, and I began thinking about how to amplify the effect these achieved.



A wire skin panel on exhibition in 2020

Dubship I on
Dig Where You Stand
2022

The wire skin panels have been passivated yellow for a gold effect.

Hot Mesh is a modular system for creating space through interlocking, rearrangeable elements. It builds off the aesthetics of the tropical breeze block, Mozambiquan burglar bars, and the stonework of Great Zimbabwe, along with mathematical tiling, engineering structures, and biological and chemical lattices. Each X-module is a work of art in itself.

Shapeshifting Chandelier and **Dubship I** used yellow and clear passivation for a gold and silver effect; since then we have also used brass and nickel electroplating for higher-end items in our SPACECRAFT series.

For **Hot Mesh**, brass and nickel would represent a higher-end craft finish, and refer to Zimbabwe's mineral deposits and mining; zinc galvanising (passivation) would represent an everyday use of materials and processes, in an African street vocabulary (as we used oil drums and jerry cans for **Dubship I**).

XW01 Maxi

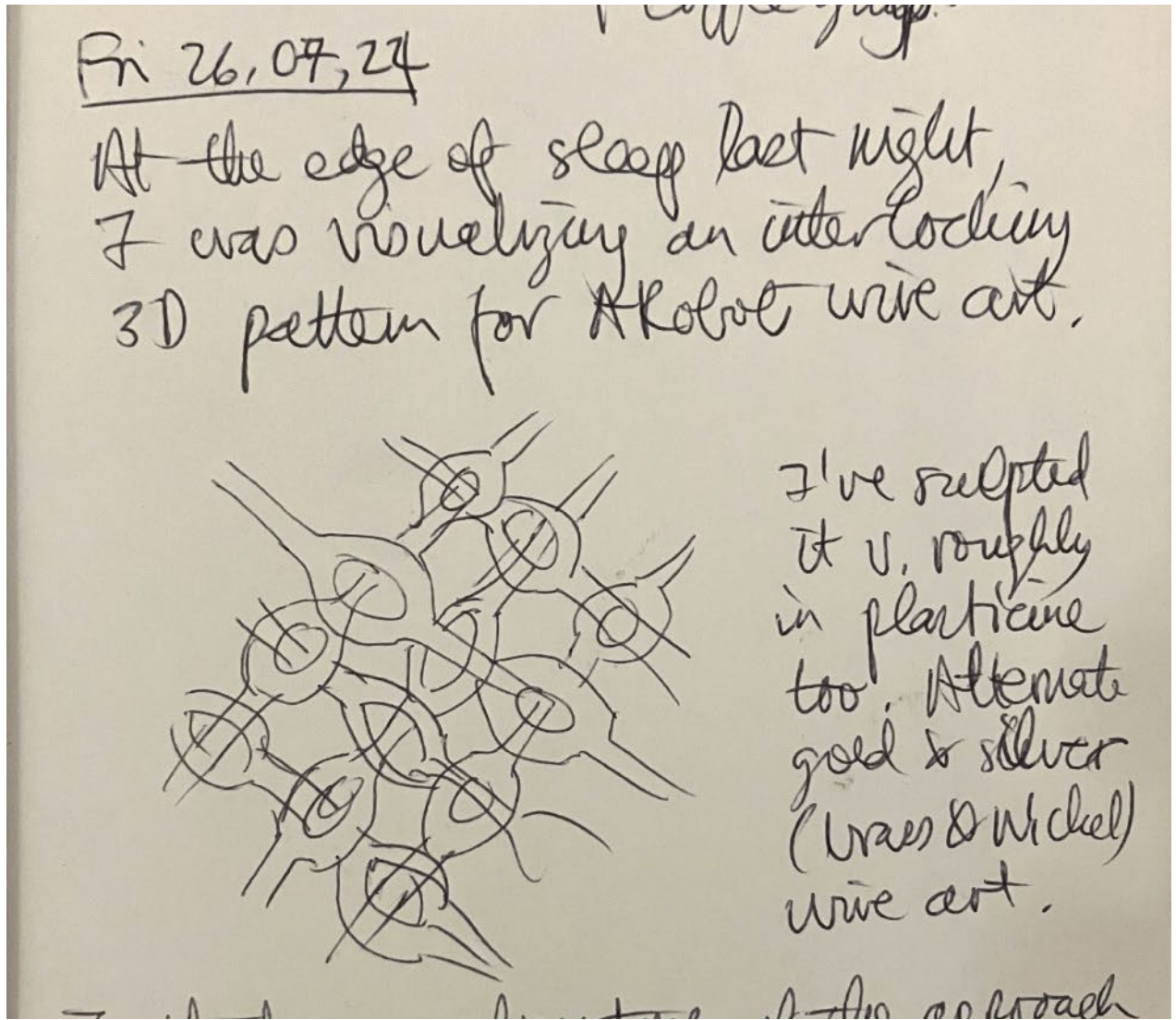
In brass plated steel wire

DS Tableau
2019

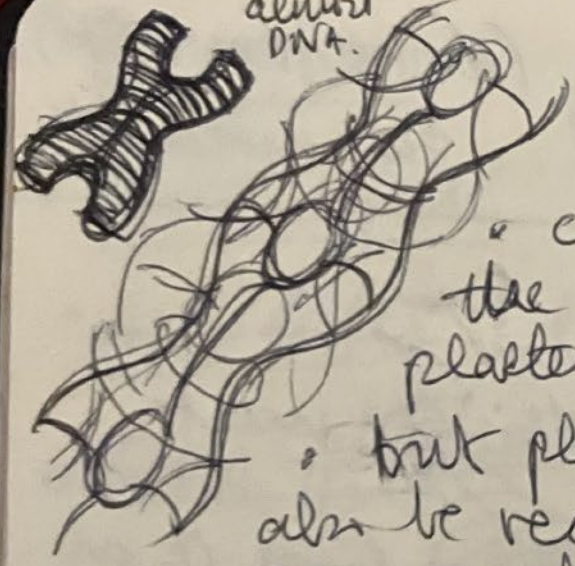
A large-scale commission representing our work with meticulous wireframes, made using CNCed jigs and Virtual Reality mockups.

‘I woke up from a dream one morning’, says Ralph Borland of **Hot Mesh** ‘and this interlocking structure of three-dimensional chains was in my mind. I grabbed the notebook by my bed and sketched it out before it could disappear. As a result, I can still see it now in my mind’s eye’. He took his sketches into the studio, and sculpted them in modelling clay to test out the design. From there he iterated them into a modular system with the X-module as its Ur-piece.

“It looks to me like a totem or a Tonga stool, perhaps an African wooden head-rest of the type used to protect an intricate hairstyle. It reminds me of a figure raising its hands in the air’. Next he made engineering drawings for the piece to be 3D-modelled and printed to test out the basic system, and commissioned the first test piece to be made, by long term collaborator Farai Kanyemba.



A sketch of a dream

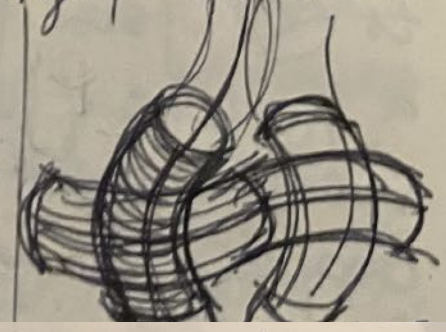


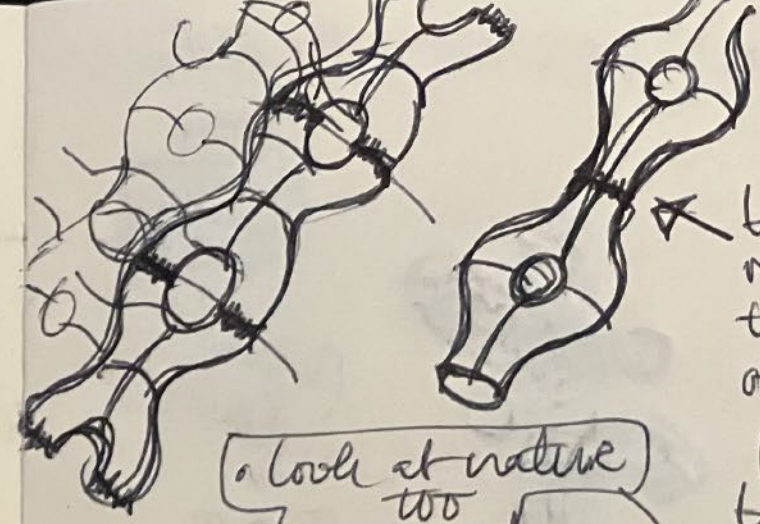
• how dense?

• curves for the shark/wave plastery

• but plastery can also be rectilinear; more turnarounds though.

> I can imagine a breeze-block/facade like opposite Gurgeon george, rectilinear





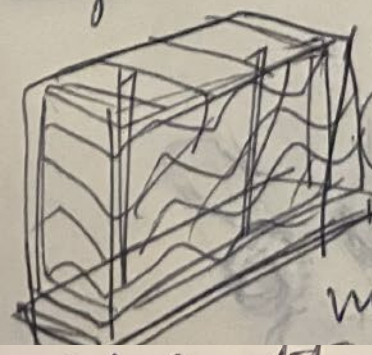
have to ~~have to~~ reach through or slight pieces to bend.

• look at nature too

+ lighting inside to cast shadows?

& lighting on edge/base to light outside?

biological models



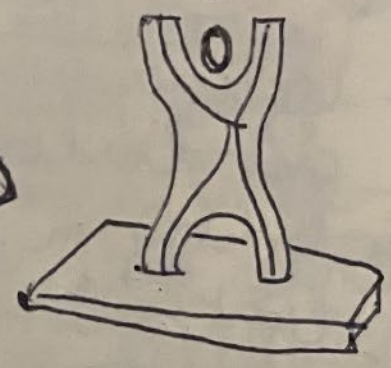
pierced pattern

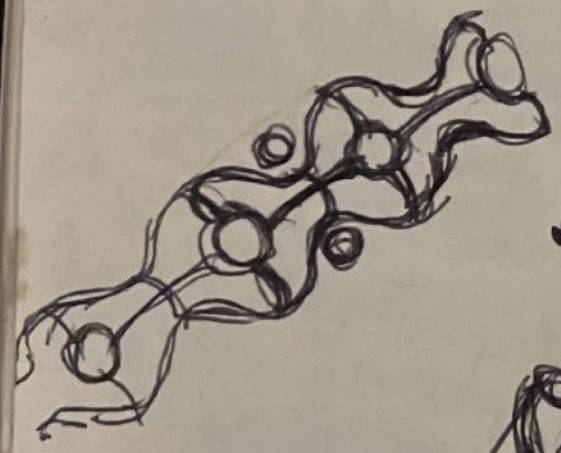
crystalline lattices

more

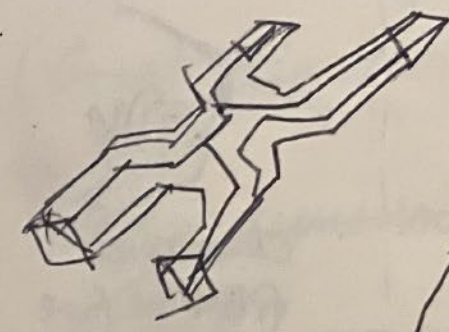
each piece an artwork,

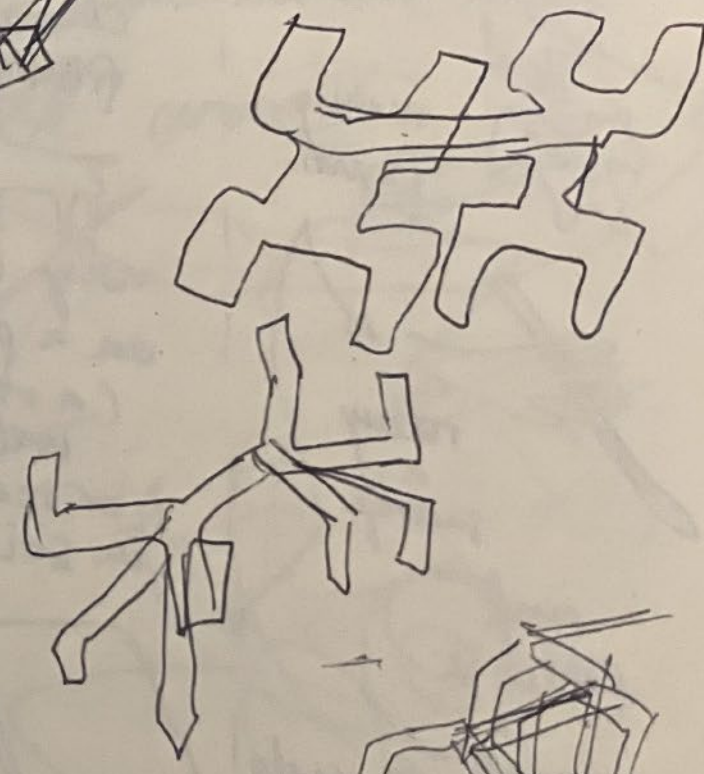
fetish like



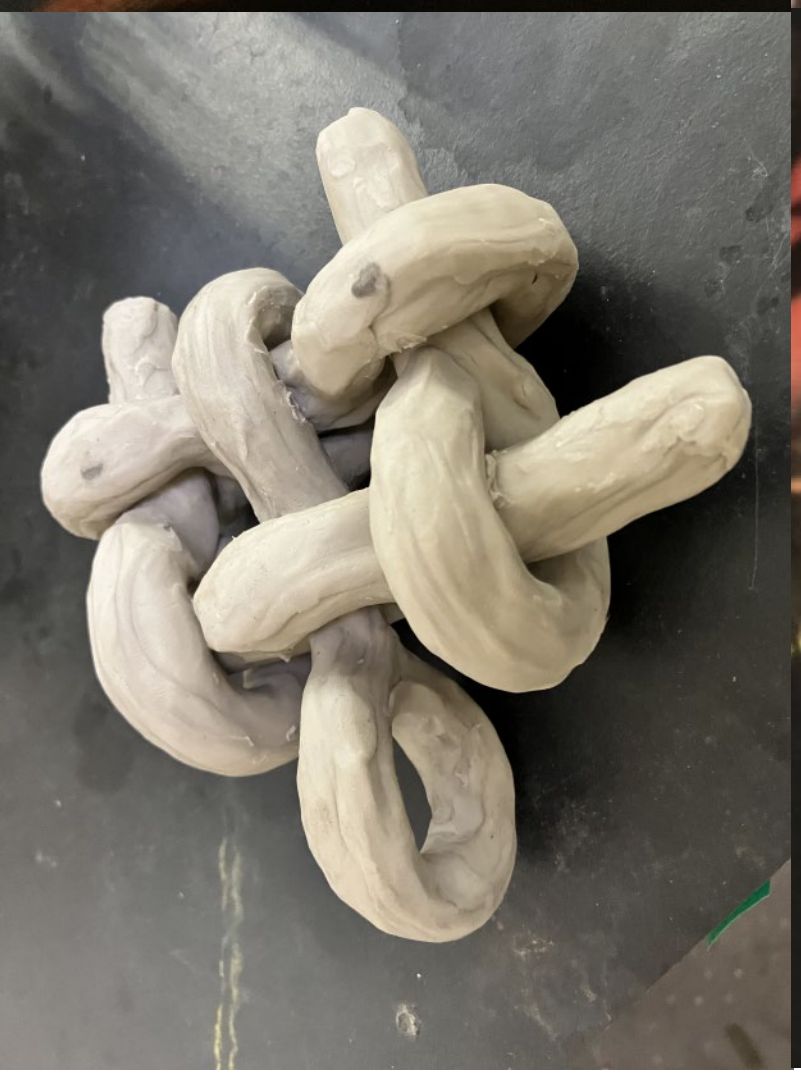


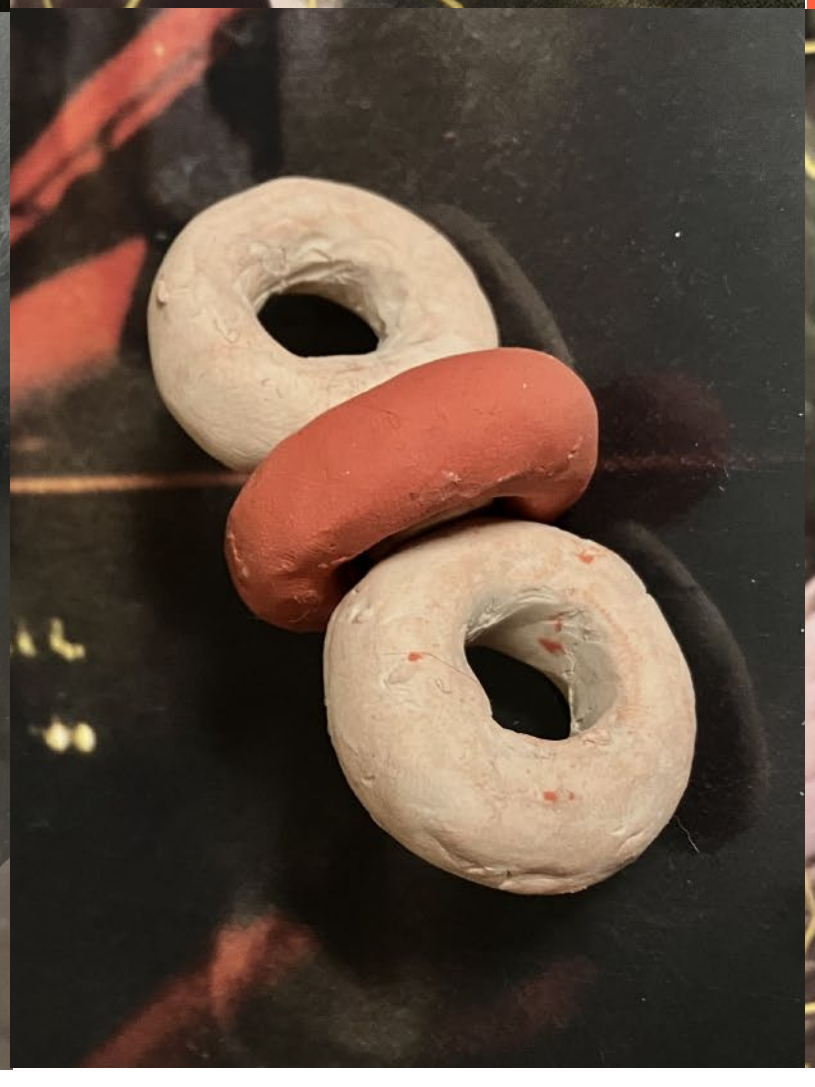
~~fabric~~ fabric-like as well.



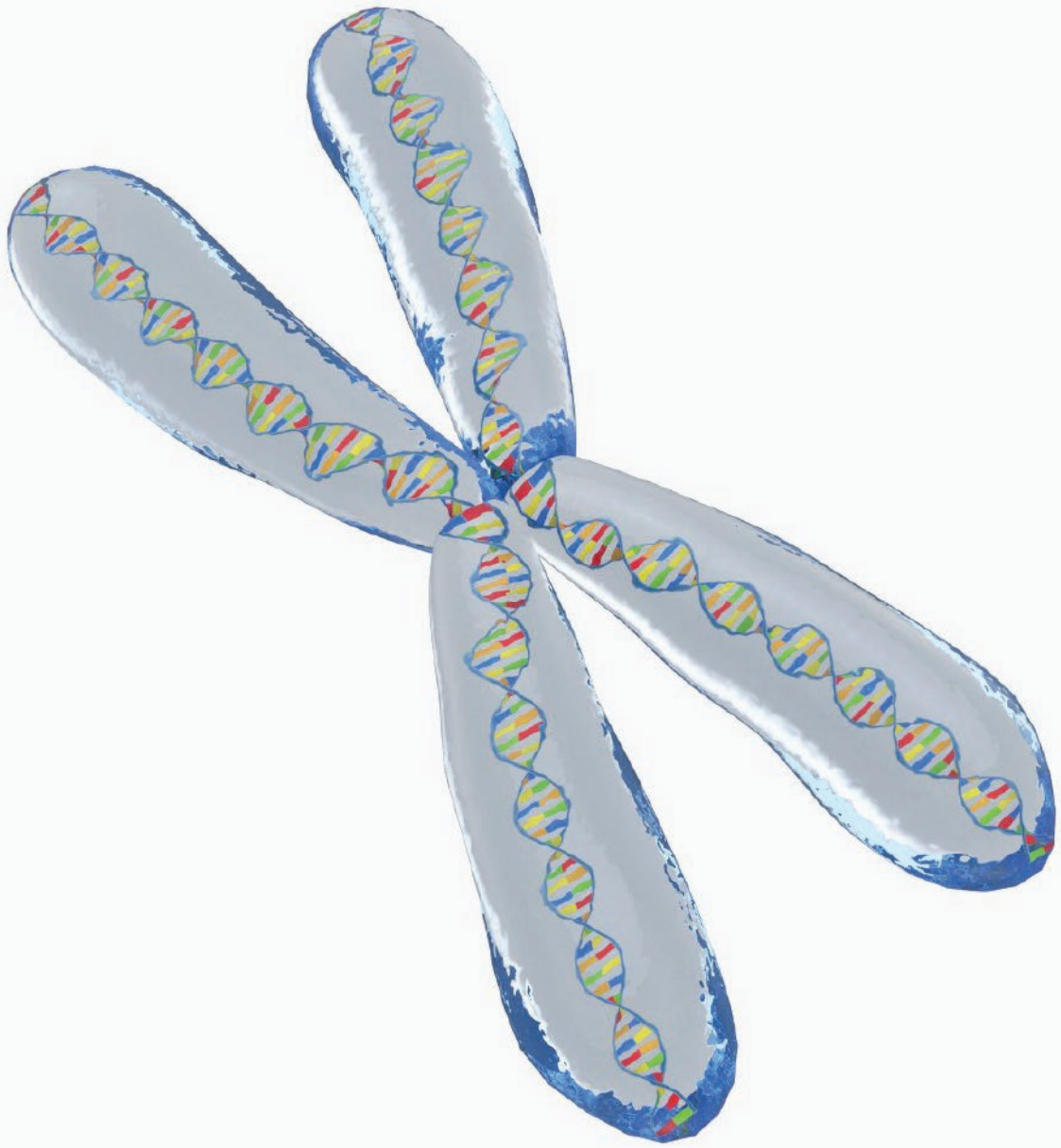


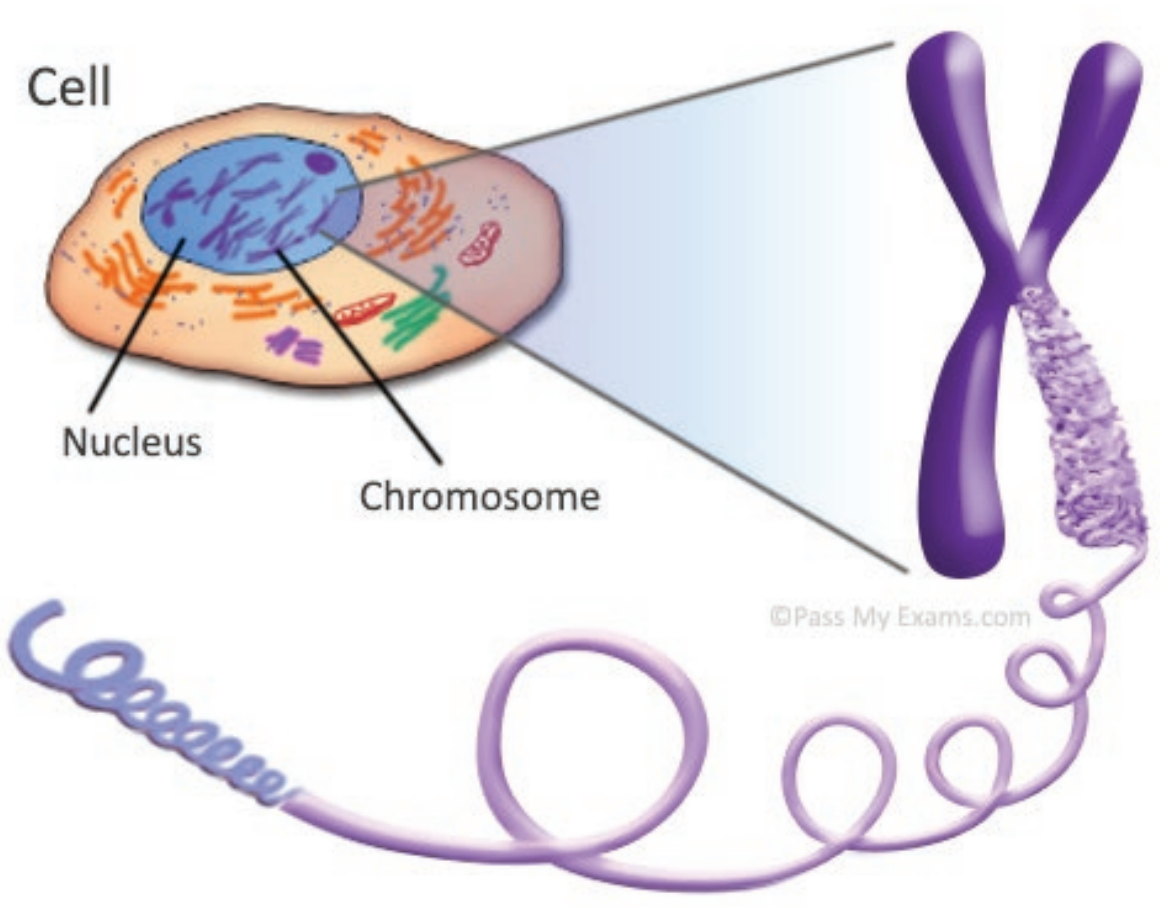

"HEAVY DE



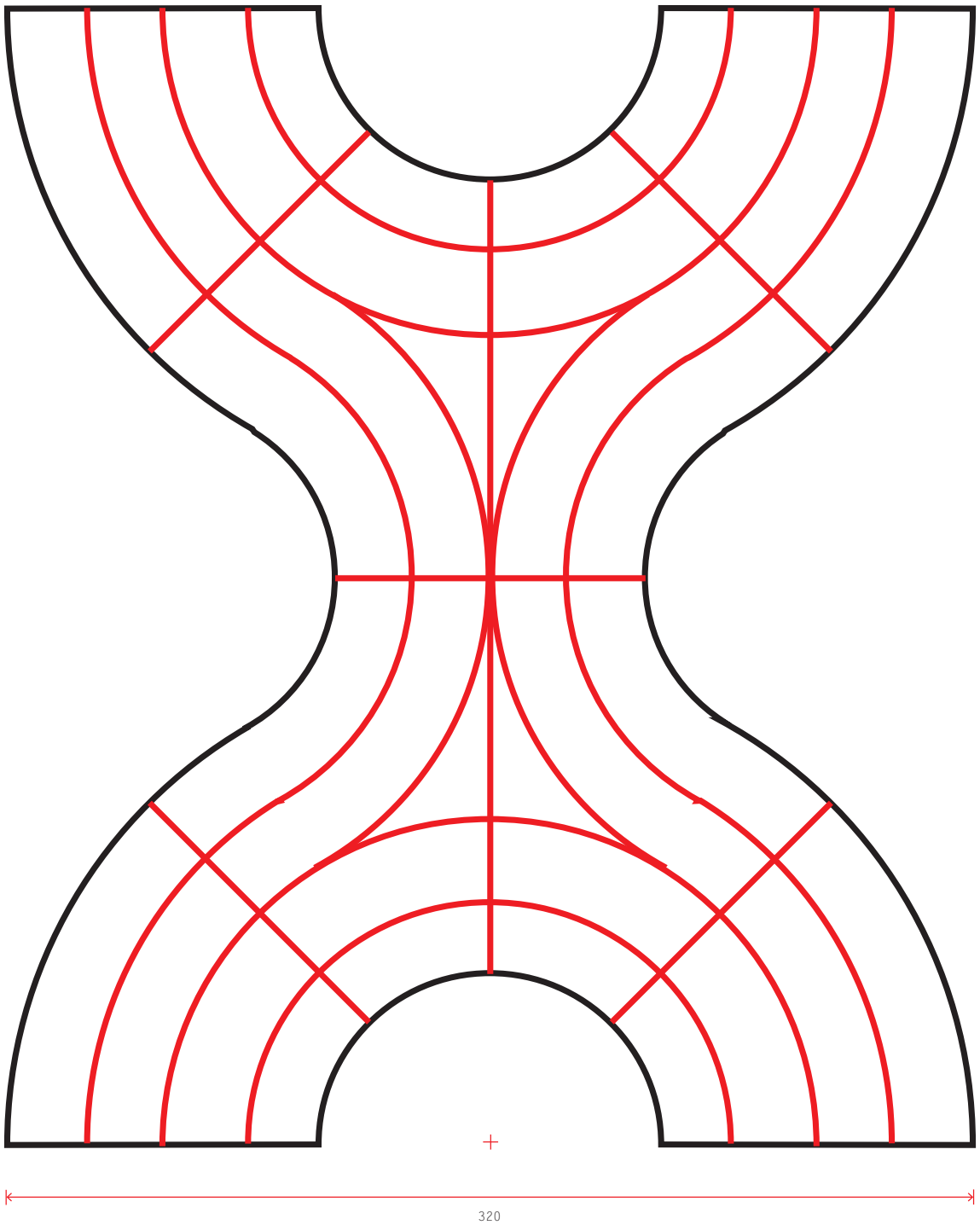


3D printed
maquette parts
(with bonus cat)

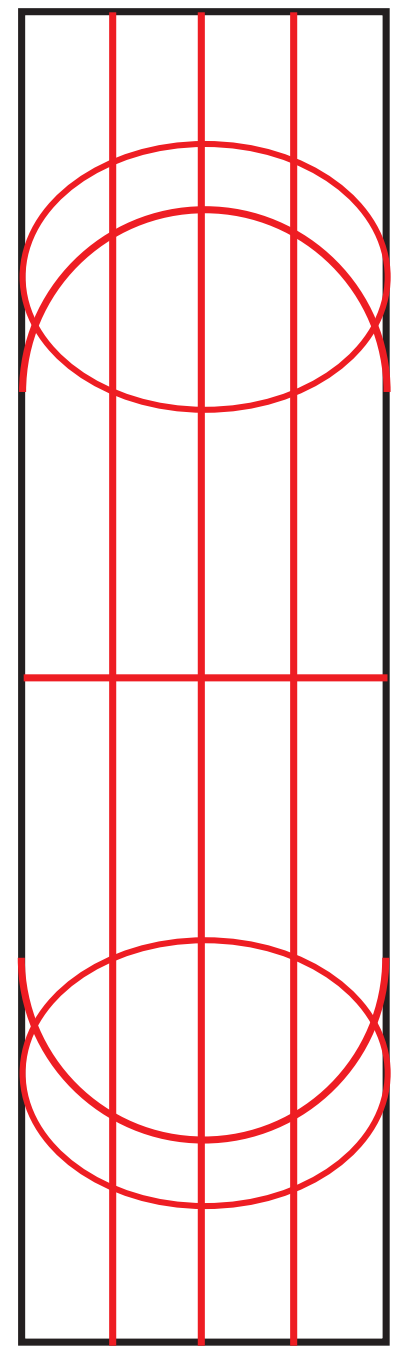




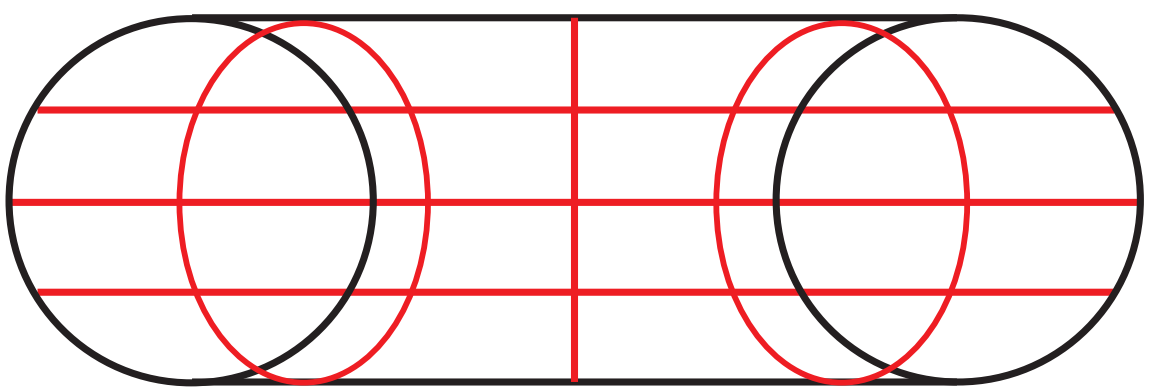
And I started to realise that there were other things the X-module reminded me of - shapes I'd learnt in high school biology and history classes in Zimbabwe: chromosomes, and precolonial metal ingots. Both of these have pleasing resonances with the subjects of the work.



FRONT ELEVATION



SIDE ELEVATION



PLAN VIEW

Farai took it on, and as we kept in touch the similarities and overlaps between a digital concept of wireframe and a wire artist's concept of wireframe kept asserting themselves, as they have done over the ten year span of African Robots & SPACECRAFT. Farai introduced additional lines to the frame to make sure the wire skin would keep its curves, exactly where a computer would place them. It was pleasurable to see the translation from dream to sketch to technical drawing to handmade object.

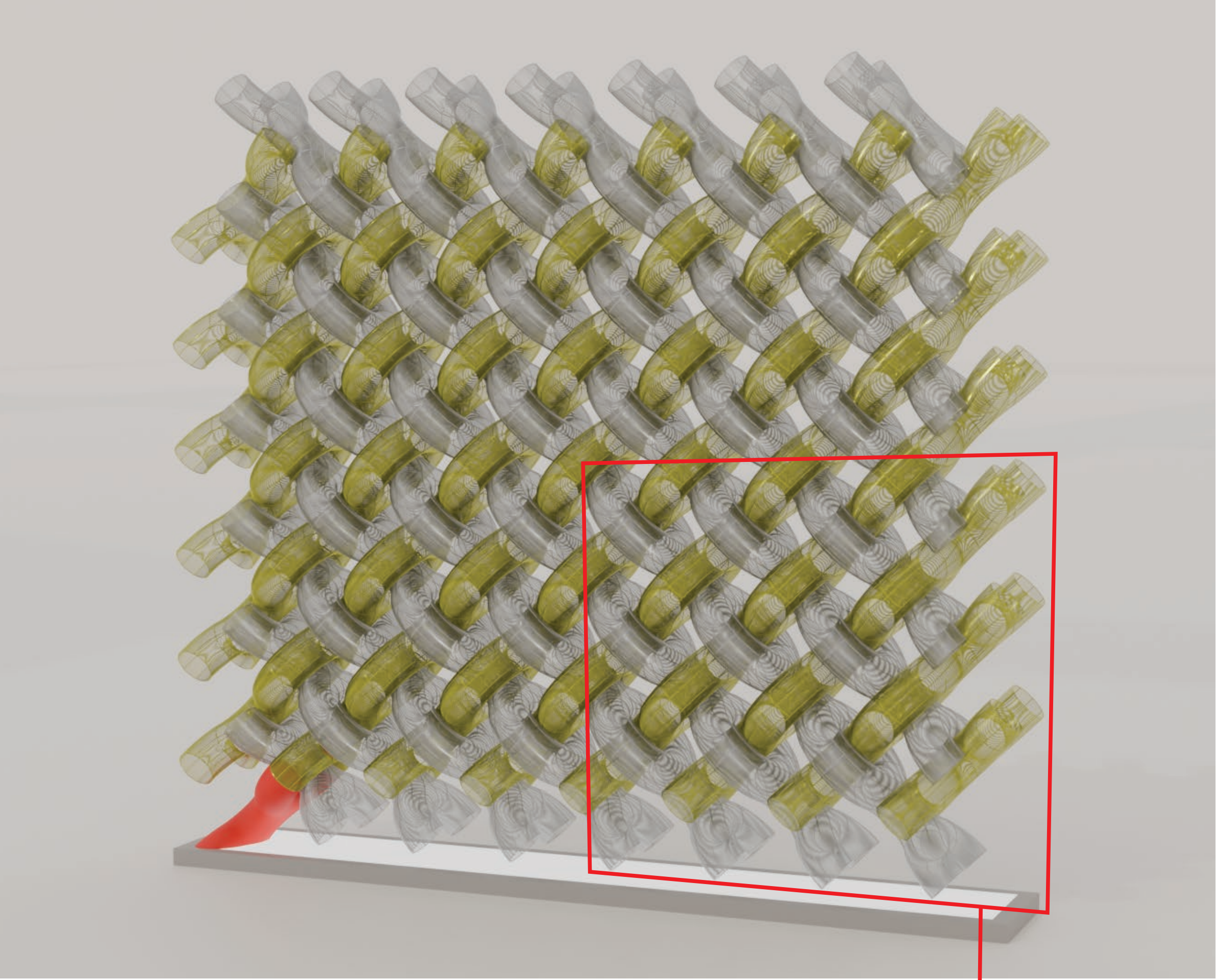
Farai examines a 3D-printed miniature while working on his wireframe.

A shark made by wire artist Lewis Kaluzi in Cape Town

And Farai found the miniature 3D-printed model I had made useful for thinking about the woven wire skin; the way the 3D-printer laid down filament was very similar to how he negotiated the curves of the object to keep to roughly parallel contour lines.

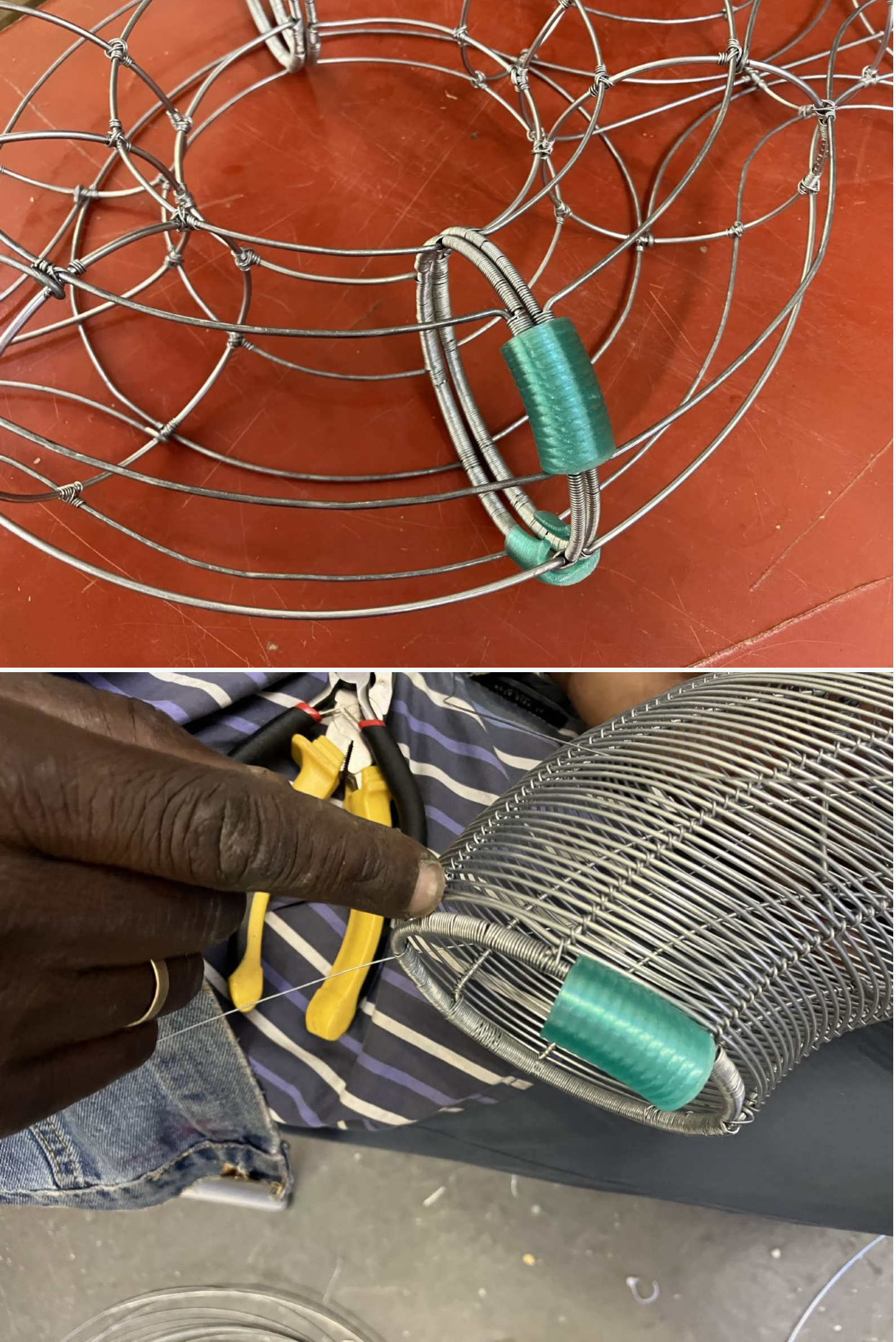
Our approach to weaving is based on the existing practices of wire artists in Cape Town who make beautiful sharks with this technique. Part of our larger intention is to highlight and elevate the ingenious ways of working with material that wire artists have developed already, applied to new forms and given wider platforms.

The sample X-module in the sun

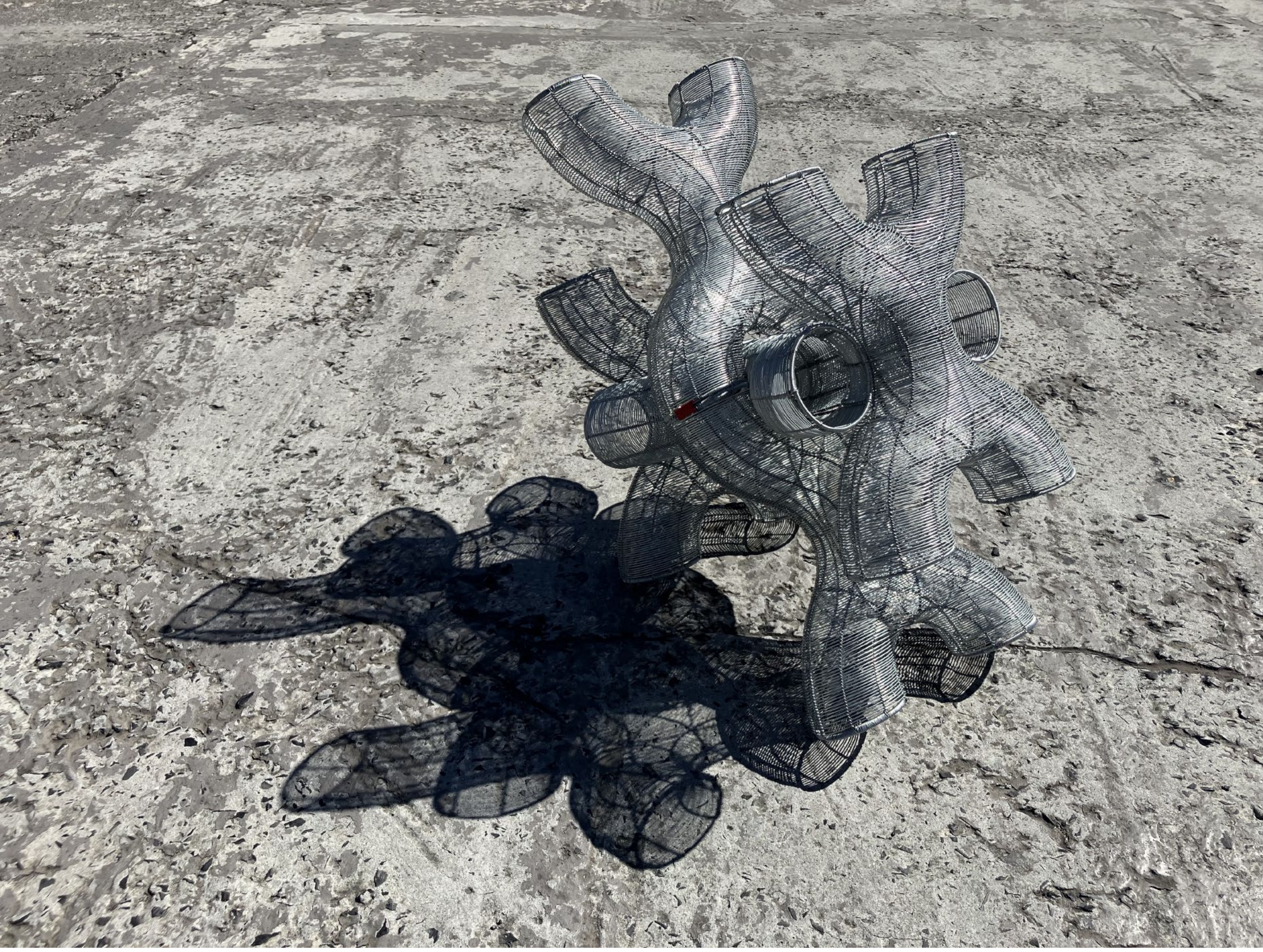


A visualisation of a
large-scale **Hot Mesh**
room divider (2m x 2m)

Protea lamps from **Shapeshifting Chandelier** 3D-printed in PETG - the same material used in plastic water bottles. The gesture here is towards recycling - and for **Hot Mesh** recyled PETG will be used for connectors.



Prototype 3D-printed connections in PETG for Hot Mesh



See a video exploring the first test assembly:

https://youtu.be/qW2T5mF-2t8

First test assembly of five pieces of **Hot Mesh**, demonstrating the shadow play and layering of the sculpture. We’re making 18 pieces for the full quarter-size prototype.

See a video of the plated samples:

https://youtu.be/W0zkWuZdpB0

Zinc galvanising and yellow passivation samples - the overall design weaves together alternating rows of gold and silver elements.

See a video of work in process:

https://youtu.be/TARwH_CDgY4

Master shapers Chris, Artwell and Sayi at work with the assistance of lasercut jigs to make the wireframe X-module structures, for wire weavers to ‘plaster’.

Wire artist Felix Mukuze plastering an X-module. using an intricate and exacting process that takes 4 - 5 days to complete.

Spier Arts Trust supported 100 days of skilled handwork by master wire artists to create MAYA, the first iteration of Hot Mesh. This is the latest support for African Robots, which has received over R2-million in grants and commissions over the last ten years.

Grant Funding 2015 – 2023

Funder	Project	Date	Amount
British Council and Dept of Sports, Arts and Culture, South Africa	African Robots in London	2015	R100,000
Pro Helvetia Ant Funding Award	African Robots in Harare	2015	R60,000
National Arts Council, South Africa	African Robots vs SPACECRAFT	2017	R100,000
International Symposium of Electronic Arts	African Robots in Durban	2018	R25,000
National Arts Council, South Africa	African Robots vs SPACECRAFT II	2018	R300,000
Business and Arts South Africa	African Robots in Korea	2019	R25,000
Pro Helvetia Ant Funding Award	African Robots in Maputo	2019	R36,000
Business and Arts South Africa	Zizi Nite Light	2019	R50,000
Dept of Sports, Arts and Culture, South Africa	African Robots online	2020	R75,000
African Culture Fund	Digi-Dub Club VR artwork	2020	R34,000
African Artists Foundation	Dubship to Ghana	2022	R230,000
Spier Light Art Festival	Zizi Nite Light II	2023	R100,000
TOTAL			**R1,405,000**

Major commissions 2019 – 2023

Client	Project	Date	Amount
Amazon	DS Tableau	2019	R250,000
Business Arts South Africa	Tok.Tokkie Award Trophy	2019	R100,000
Gorgeous George Hotel	Shapeshifting Chandelier	2023	R200,000
Babylonstoren	Windpomp	2024	R75,000
TOTAL			**R625,000**

For more information, links and video see:

https://africanrobots.net/hot-mesh