Eric … I wonder if you can pass this along to Chris? Since he is taking a class in welding for the purpose of doing some sculpture, he may find something of interest.

The link to the video is below:

https://www.youtube.com/watch?v=dzNjqm8EBQ4&t=6s

I've been trying to gather together some things that I have worked on, that may be of interest to others in the future. This is one of them. One principal emerges. Use as little weld as possible and get a shape that has impact, while maintaining strength.

The video shows what motivated me. I wanted to capture the concept of Renewal in that the Sculpture is placed at the nexus of the old Museum and the new Museum and therefore is a dramatic RENEWAL in the DNA sense… Old + New = Better

As to welding there is very little in the Sculpture. I did not want to depend upon welds except for a few spots. The welds attach the rods to the chain at the end of each rod. Link to link there are no welds and the chains fit perfectly. Each link falls into place because the geometry forces it to do so. This subject is worth an entire lecture… Geometry of a Single Sculpture. I had a jig that when turned made the shape appear like magic because I'm wrapping the shape going from 2D to 3D. Each link is 56 degrees to the horizontal, by the way. Of course the links form a geodesic of a cylinder.

We start with a straight line and 'roll' the shape up into a cylinder and the final positions take care of themselves. For example, an ordinary cardboard toilet paper holder illustrates what happens. We see a helix on the cardboard when it is a cylinder. If we cut the cylinder vertically and flatten it out, we see a straight line on a plane. The helix is a geodesic of a cylinder.

You can see the drawings that I did in the video. Since the double helix is a developable surface in the sense of Gauss and Differential Geometry, everything works perfectly. So we go from 2 D to 3 D in the blink of an eye. It was easy to do the design in 2D and then 'role' it up into cylinder. The chain follows the straight line perfectly in 2D and perfectly in 3D.

I had done precision drawings, small scale models and also a wooden and an almost full scale model to get an idea of the aspect ratio that would be pleasing. Real DNA has a squat appearance. It was not appropriate. The wood model was done at a farm owned by Bob Trelford. Giles Roy did the welding and the jig beforehand and the welds took less than an hour. He is a wonderful person and caught on immediately. I started the installation at 8:10 on a Saturday and the Curator of the Museum took us to lunch at 12:15. We were done.

So you see the double helix is really wrapped around an invisible cylinder. As you walk around it you can see the basic geometry morphing sines to cosines … etc. The mathematics is in parametric form with the basic parametric vector Sculpture(theta,t) = (x*r*cos(theta), y*r*sin(theta),theta*t)

There is a 5'x5'x5' reinforced concrete base hidden under the sculpture that is in tune with the other visual parts.

The sculpture is placed in an alcove that does not have 90 degree walls one to another. Magically, the wind swirls around in this space tossing leaves and snow in a unending spiral dance. You can see the snow on the Sculpture. It appears to me that you can generate these logarithmic swirls, if you have a 3 sided enclosed space that is open at the top and has no right angles. It turned out to be true.

One of the frames in the video shows a night view with the chain links outlined on the wall of the old building. This was NOT by chance. I installed an industrial microprocessor that can control 4 lights. They go on and off in a pattern with each light starting dim and then morphing to full on and then down to nothing. The lights come on and off and the chain moves up and down on the wall shown It's a pattern that is beautiful at night.

I did a test using the 6 inch model, a white screen and with an intense light behind it and a necklace chain. The pattern appeared perfectly and I knew it would come out well with the full scale sculpture and it did!!

I used CAD3D for design software which I was in charge of while at Cimlinc. Eric remembers those days well. I like the Sculpture a lot. Since it can be viewed from many levels and angles, I wanted to 'fly' through it before it was built. I was able to do that as you can see from the animation.

Early on in the video, I show the ship, the Erie Stewart in full sail. I got the chain from its tragic Lake Huron grave.

I did the music of Yesterday. I took the Beatles basic song and made a Bach Fugue out of it. I designed the feel of the music to melt into the geometry. The physical music is done using the sound card on your computer or any listener's computer. When played on a good speaker system, the music is nice in that I use the stereo ability to emphasize the beat of the music. Listening to it, you can hear and feel Bach.

Finally, there is an animated farewell using the word FAREWELL. I used Cad3D for that too.

I really had fun doing all this.