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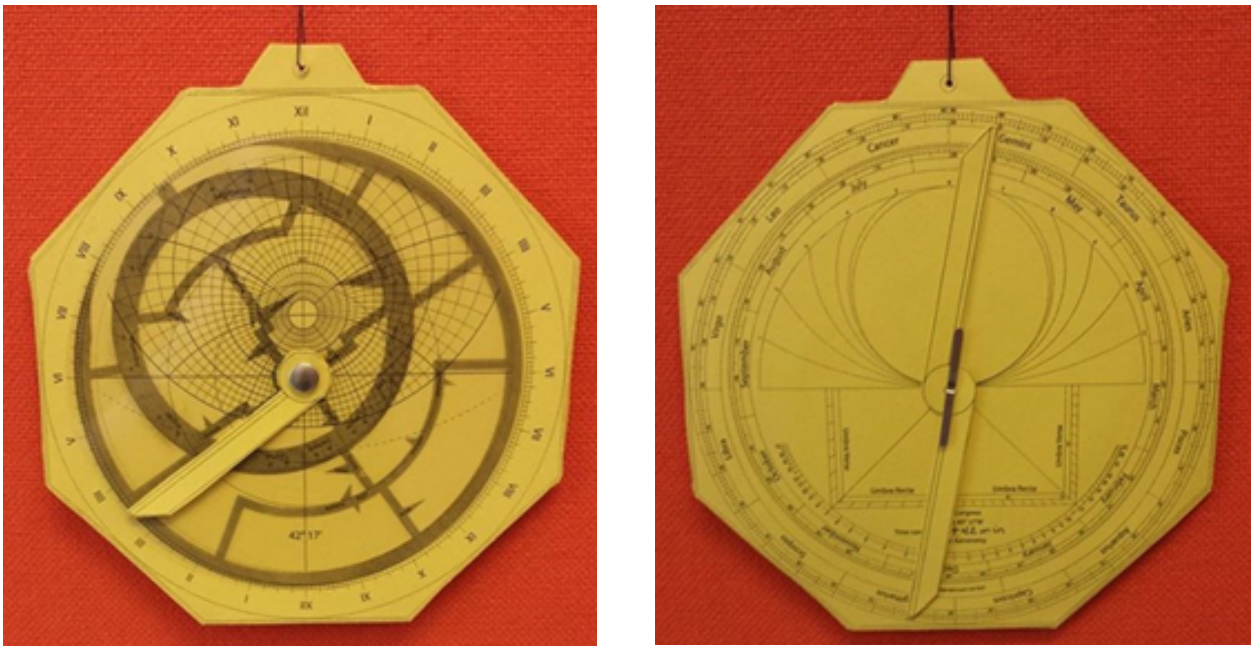
Abstract

A reflection on the long, long year of 2020 and its impact on one astronomer's astrolabe outreach.



Front and back view of a cardboard astrolabe. The front side shows the brass fastener, rule (pointer), rete with star positions (made of plastic), and plate (with gridlines based on the latitude of use). The back side of the astrolabe shows the movable alidade and various scales.

During the COVID-19 pandemic our mantra as teachers, researchers, and human beings has largely been "good enough." We have been in "fight or flight" mode for more than a year. Every aspect of our lives has seemingly been measured on a sliding scale, as we have desperately tried to keep up our enthusiasm, our motivation, and our dedication to excellence as we have sought to keep students on track for graduation and helped those who were graduating try to re-package their resumes. We have been doing the academic equivalent of a comb-over: attempting to hide the obvious gaps in students' work experience caused by the decreased opportunities available to them during COVID-19. Gone were precious hours spent in archives pouring over manuscripts for which electronic versions do not yet exist, in the museum observing the exquisite details in sculptures or paintings that only proper lighting can reveal, or in the laboratory analyzing samples of paint, stone, textile, or DNA in order to reconstruct the details of medieval life.

In my case there were no nights at the telescope, no days in the planetarium. My students were given an inferior education, and there was not a single bloody thing I could do to stop it. No virtual experience could hope to replace the thrill of eye on eyepiece, or experiencing what it feels like sitting at the center of the planetarium with the heavens projected overhead. The former allows one to understand Galileo, the latter the pre-Copernican world.

Perhaps the final straw for me in terms of my willingness to participate in virtual events was a community engagement project that was seriously impacted by the pandemic. In the hopeful held-breath of early Fall 2020, after the second wave of the pandemic in the US, some limited in-person

activities (masked and socially distanced of course) were still available in some communities. The Free Library of Philadelphia had long planned an in-house live exhibit on "Medieval Life" at the Dietrich Gallery (curated by Dot Porter of the University of Pennsylvania), featuring manuscripts from the rich collections housed in various institutions in the Philadelphia area. The event was also meant to highlight the *Bibliotheca Philadelphiensis* digitization project (BiblioPhilly n. d.). In-person attendance was scheduled to begin on October 19 (augmented by an online virtual exhibit), and I was contacted on October 1 with a request to help them put together a do-it-yourself astrolabe kit for local families to pick up at the library and carry out a live virtual how-to session in late December.

Having conducted live hands-on workshops on the use of astrolabes for the International Congress on Medieval Studies (ICMS) at Western Michigan University and the International Medieval Congress (IMC) at the University of Leeds for several years, this was certainly within my skill set. I was admittedly apprehensive about doing the presentation remotely as I live about 200 miles away in Connecticut. However, the opportunity to help the families receive a complete kit with everything they needed to put together a cardboard astrolabe seemed like a valuable educational experience, particularly in a year when any hands-on science would be an improvement. For as I had learned the hard way in teaching my own HyFlex hybrid classes that semester, having the students attending from home conduct "kitchen table" type science experiments was a superior learning experience to passively observing high-tech demonstrations on camera. I convinced myself the "remote astrolabing" would be "good enough."

As I routinely do for my in-person sessions, I utilized the Astrolabe Project's online astrolabe generator to produce the necessary files for the front and back of the astrolabe's body and plate (set for Philadelphia's coordinates), rete, rule (front pointer), and alidade (back pointer), and converted them to pdfs for duplication by the library staff (Wymarc n. d.; see pictures above). The rete needs to be printed out on a sheet of acetate plastic (an old-fashioned overhead slide) and the other pieces on cardstock. The finishing touch is a single brass fastener to hold it all together. I had planned on using handouts from my previous in-person sessions to put together an instruction sheet explaining how to assemble the parts and walking users through a few very simple calculations in preparation for the live session. The plan had been for the library staff to put together kits that families could pick up in person. The individual pieces would already be printed out on the proper materials and ready to be cut out and assembled by the families at home.

Then the Third Wave loomed on the horizon.

There was no in-person opening of the exhibit, no opportunity for families to pick up completed kits. There was only "good enough."

We pivoted to posting the instructions and templates online for families to print out and assemble on their own, if they chose to; otherwise they could just attend my live session and learn about the history of the astrolabe and see me running through a description of some types of calculations using both a cardboard version and metal replicas I have in my office. I filmed a short video explaining the various pieces of the astrolabe and walking them through the construction process that was posted online as well (Larsen 2020). The actual live event was, not surprisingly, rather sparse in attendance,

although the families who did attend were interested and very appreciative. It was "good enough" after all.

While I certainly do not regret the time and effort involved with this project, it did bolster my opinion concerning the significant differences between hands-on science and science "show and tell". As I had learned in my HyFlex hybrid courses, just as science education is not a spectator sport, neither should be science outreach. Astronomy is already a far more remote science than biology or geology – the objects of study are generally, to borrow from Carl Sagan, billions and billions of miles distant. This makes those rare instances where hands-on opportunities are realistic that much more valuable, such as feeling the weight of an iron meteorite—or brass astrolabe—in your hand. The difference between seeing someone twirl the rete of an astrolabe and calculate the time and actually doing the calculation yourself (even using a crude cardboard astrolabe) is the difference between entertainment and education, between magic and science. For this reason, I have respectfully and consistently answered "no" when the ICMS and IMC inquired about my doing my astrolabe workshops virtually for their respective 2021 conferences.

Virtual astrolabes are like virtual pizza—pretty to look at, but not particularly satisfying. I look forward to returning to hands-on workshops once we give up the Zoom conferences and can meet in the flesh once again. It's almost enough to make you miss that warm white wine poured from a box that was the staple of on-ground conferences in the "Before Time."

Almost.

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