NEWSLETTER
of
The American Musical Instrument Society
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# AMIS heading "onwards" to Calgary, Canada

The 2022 annual meeting will take place at Studio Bell, home of the National Music Centre (NMC) in Calgary, Alberta, Canada from June 8th to 11th. After a cancelled meeting in 2020 and a virtual meeting in 2021, we are all looking forward to gathering in person for our yearly conference.

The choice of venue is very exciting for AMIS members as Studio Bell is a relatively new museum and performance space. The impressive 160,000 square foot building was designed by Allied Works Architecture and opened on Canada Day, July 1, 2016. Studio Bell is more than a museum, offering exhibitions and live concerts, as well as artist development and education programs. Additionally, the building incorporates the King Edward Hotel, one of Calgary's oldest buildings and a legendary blues club.

The musical instrument collection spans over 450 years of music history and innovation and is comprised of more than 2,000 pieces that help tell the stories of music in Canada. The collection is the foundation for many programs offered at Studio Bell and provides artists and visitors with unprecedented access to music history and technology. Like all museums, not everything is on display. While many unique pieces from the collection can be found on display throughout Studio Bell, the "living" collection provides visiting artists and artists in residence with access to more than 200 fully functional historic instruments. The instrument collection, begun in 1996 as the Chinook Keyboard Centre and later renamed the Cantos Music Foundation, is especially noted for its collection of vintage electronic instruments of the 20th century and stringed keyboards dating from the 17th century to the present.

*Keyboards on display at Studio Bell.*

*(Continued on page 3)*

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**NEWSLETTER** of the
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The Newsletter is published three times per year for members of the American Musical Instrument Society (AMIS). News items, photographs, and short articles or announcements are invited, as well as any other information of interest to AMIS members.

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# LETTER FROM THE PRESIDENT

Dear AMIS colleagues,

I'm really looking forward to our first in-person meeting since 2019. Calgary is a wonderful city to visit, and the line-up of papers and presentations looks terrific. It will be nice to see old friends and to meet people I know only online.

I especially look forward to welcoming our Gribbon Scholars, Outreach Grant recipients, and student presenters. The Small Research Grants for Students that we offered last year in place of the Gribbon Awards (since the conference was online) were very successful: all the awardees submitted proposals for the 2022 meeting, and all were accepted. We will be continuing this grant on a smaller scale, offering two grants this year. Details may be found at AMIS.org and the deadline for applications is June 1, 2022.

Before the pandemic, we engaged in a strategic planning exercise to develop ideas about future directions for AMIS. It's clear that to remain a vital organization we need to attract new members and to interest young people in organology; we also need to support the research interests and careers of our members. The pandemic has now caused us to consider some new ways of doing things, and last year's successful online conference provided some promising possibilities. I hope that the upcoming meeting will provide opportunities to revisit these ideas and to hear everyone's thoughts on how to update them and put them into action.

Janet Page
President

# News from the Editor's Desk

Spring brings signs of renewal and as the weather improves and the flowers blossom, it also brings the excitement of the first in-person AMIS meeting since 2019. Returning to Calgary, the annual meeting will be taking place in Studio Bell, the home of the National Music Centre. In this issue of the Newsletter, we have an overview of the conference and the provisional schedule for the event. It is an exciting program and we look forward to seeing our fellow AMIS members in person soon.

Also in this issue, Brian Applegate presents a scientific analysis of possible alternative woods to be used for fingerboards—an important consideration with the growing scarcity of traditional materials. Geoffrey Burgess and James Kopp give a touching tribute to Richard and Jeannine Abel and highlight the amazing collection the two assembled over their lifetimes. Lastly, we announce the winners of the 2022 AMIS awards. Read their short bios and find out the winning book and article on page 19.

As always, we welcome short submissions (maximum 500 words) as well as short articles. Email all submissions and suggestions to: amisnewsletter@gmail.com.

Sarah Deters
Editor


It will be fascinating for AMIS members who attended the 2008 meeting, which was held at the Cantos Music Foundation, to see the dramatic transformation of this organisation. We all look forward to meeting our AMIS colleagues Andrew Mosker and Jesse Moffatt, who have been leading this project and updating AMIS about its progress over the years.

With Studio Bell's unique holdings, papers focused on Canadian music history and electronic music were especially encouraged and this year's conference reflects this emphasis. There are three paper sessions dedicated to electronic musical instruments and peppered throughout the conference are papers that explore Canadian instrument making and performance. Most presentations will be given live, but the conference does include some remote presentations. All in all, there will be 31 papers and 2 roundtables over the course of the three-day conference.

The social programme of the conference also looks exciting, with a "Meet and Greet at the King Eddy" kicking off the conference on Wednesday night. Two concerts are included in the programme, both of which feature instruments from the NMC's collection. The first, on Thursday night, features the Allen Theatre Organ, and the second, on Friday night, features a performance on The Original New Timbral Orchestra (TONTO). The final night of the conference will be the much-anticipated banquet, where the AMIS annual awards will be presented.

The conference looks to be a fulfilling event and is in a fitting location for renewing the energy and vitality of AMIS. As the city's motto so forthrightly says "onwards" we go to Calgary!

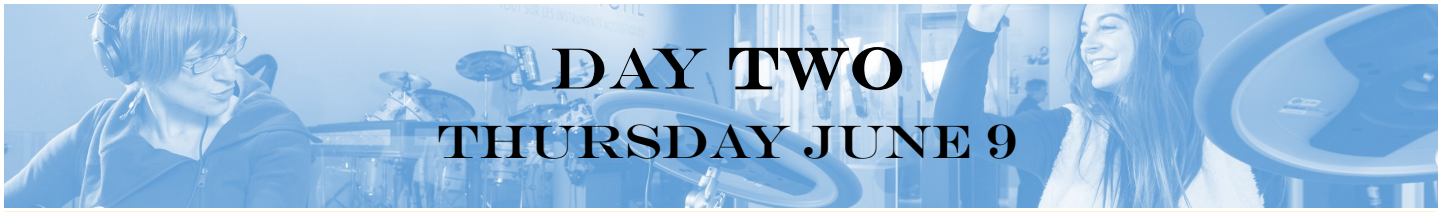
A provisional program of the conference can be found on the following pages. Please note, minor scheduling changes may occur, so please ensure you collect your official program from the registration table.


# TENTATIVE PROGRAMME

## STUDIO BELL: NATIONAL MUSIC CENTRE, CALGARY


## DAY ONE
### WEDNESDAY JUNE 8

| | |
|---|---|
| 10:00-5:00 | Registration table open (Canada Music Square) |
| | Self-guided and guided visits to Studio Bell and recording facilities |
| 6:00 | AMIS Board dinner and meeting (offsite) |
| 7:00 | Meet and Greet at The King Eddy |



# DAY TWO
## THURSDAY JUNE 9

| | |
|---|---|
| 8:45 | **Welcoming remarks: Andrew Mosker** |
| 9:00-10:30 | **Session 1: Electronic Instruments Part 1**<br>Chair: Jesse Moffatt<br>♦ **Hugh Le Caine's Electronic Sackbut, 1946 to 1954**<br>Gayle Young<br>♦ **The Electronic Sackbut Project**<br>Tom Everrett<br>♦ **The Tape Recorder as a Musical Instrument: Placing Hugh Le Caine's Special Purpose Tape Recorders in Context**<br>James Mooney |
| 10:30 | **Coffee break (25 minutes)** |
| 11:00-12:30 | **Session 2: Musical Instruments as Culture**<br>Chair: Jayme Kurland<br>♦ **Contemporary Innovations for the Đàn Bầu Monochord in the Canadian-Vietnamese Diaspora**<br>Lisa Beebe<br>♦ **Apache Fiddles: Tradition, Forced Assimilation, Commerce, and Museums**<br>Ken More<br>♦ **The Puerto Rican Tiple Requinto Costero: From the Museum Collection to its Revival**<br>William Cumpiano, Noraliz Ruiz, and Norman Storer Corrada (Remote Presentation) |
| 12:30 | **Lunch on your own (90 minutes)**<br>**JAMIS Editorial Board Meeting** |
| 2:00-3:30 | **Session 3: Preserving Musical Assets**<br>Chair: Andrew Mosker<br>♦ **Preserving and Sharing the EMI Music Canada Archive at the University of Calgary**<br>Annie Murray, Robb Gilbert, Elizabeth-Anne Johnson, David Jones, Andy Nichols, and Kathryn Ruddock<br>**(Roundtable—60 minutes)**<br>♦ **Historic Cardboard and Metal Discs Revisited**<br>Heike Fricke |
| 3:30 | **Coffee Break (25 minutes)** |
| 4:00-5:30 | **Session 4: Wind Instruments**<br>Chair: Janet Page<br>♦ **A Flute by Any Other Name: The Uncommon and Curious Dolzflöte**<br>Patrick Connor Dittamo<br>♦ **Tone, Technique, and Technology: Nineteenth-Century Debates on Italian Flutes**<br>Samantha Tripp<br>♦ **A Breath of Modernity! Camille Saint-Saëns and Wind Instruments**<br>Fabien Guilloux and Emanuele Marconi (Remote Presentation) |
| 5:30 | Dinner on your own |
| 7:00 | **Bar opens** |
| 8:00 | **Concert: Silent Movie, featuring Chris Maric performing on the Allen Theater Organ**<br>(Doors open at 7:30) |

# DAY THREE
## FRIDAY JUNE 10

| | |
|---|---|
| 9:00-10:30 | **Session 5: Electronic Instruments Part 2**<br>Chair: Adam Fox<br>♦ **Rebuilding the 5th Triad A Range**<br>Jason Tawkin<br>♦ **From Datasheet to Dancefloor: The Elektron Sid Station**<br>David Jones<br>♦ **The Pervasive use of English in Electronic Music Instrument Design and its Effect on Non-native Speakers**<br>Pablo Dodero |
| 10:30 | **Coffee Break (25 minutes)** |
| 11:00-12:30 | **Session 6: Banjos and Harps**<br>Chair: Jimena Palacios Uribe<br>♦ **What is an Early Banjo? An Exploration of an Instrument's Relationship to Organology and Ethnomusicology**<br>Kristina Gaddy and Pete Ross<br>♦ **The Mysterious Affair of Queen Marie Antoinette's Harp: A Case for the Harp Detective**<br>Fanny Guillaume-Castel<br>♦ **The Hochbrucker Family and the Adoption of the Pedal Harp before 1760**<br>Mike Baldwin and Lewis Jones (Remote Presentation) |
| 12:30 | **Lunch Break and Annual General Meeting (90 minutes with lunch delivery option)** |
| 2:00-3:30 | **Session 7: Musical Engagement**<br>Chair: Heike Fricke<br>♦ **Archiving Post-1960 Musics: Four Experiences of Engagement**<br>Valentina Bertolani, You Nakai, Luisa Santacesaria, and Gayle Young<br>**(Roundtable—60 minutes)**<br>♦ **Historical Instruments in Virtual Acoustic Environments: A Framework for the Generation of Interactive Virtual Acoustic Objects and Multimodal Organological Datasets**<br>Dominik Ukolov |
| 3:30 | **Coffee Break (25 minutes)** |
| 4:00-5:30 | **Session 8: The Violin Family**<br>Chair: Matthew Zeller<br>♦ **The Serafin Violinmaker Family: Macro to Micro Level Approach for the Study of Two Violins Held in the Correr Museum in Venice**<br>Chaehoon Lee<br>♦ **Hexagram or Star of David? A Modern Interpretation of Markneukirchen Violin Inlays Under the Microscope**<br>Stella Smith<br>♦ **Tuning, Timbre, and Technique: Reconsidering the 19th-Century Double Bass**<br>Shanti Nachtergaele |
| 5:30 | **Dinner on your own** |
| 7:00 | Bar open |
| 8:00 | **Concert: Robin Hatch performing on The Original New Timbral Orchestra (TONTO)**<br>(Doors open at 7:30) |

# DAY FOUR
## SATURDAY JUNE 11

| | |
|---|---|
| 9:00-10:30 | **Session 9: Miscellaneous Topics**<br>Chair: Ken Moore<br>♦ **George Hooper Mead: One of Canada's First Instrument Makers, 1827-1851**<br>Francis Lapointe<br>♦ **Italian Non-sounding Musical Instruments in the Age of the Marvelous: Functional Objects Without Function**<br>Arianna Rigamonti<br>♦ **"Clicking the Ivory": A.M. Virgil's Tekniklavier Revisited**<br>Jörg Holzmann and Patrick Speckamp (Remote Presentation) |
| 10:30 | **Coffee Break (25 minutes)** |
| 11:00-12:30 | **Session 10: Guitars**<br>Chair: Jonathan Santa Maria Bouquet<br>♦ **The Instrumental Women of Fender**<br>Jayme Kurland<br>♦ **New Soundscapes on the "Ligeti guitar": Chopin, Kurtág, and Saariaho**<br>Katalin Koltai<br>(Lecture-Recital)<br>♦ **"I Can't Turn Off What Turns Me On": A Queer Phenomenology and the St. Vincent Signature Electric Guitar**<br>Erin A. Fitzpatrick (Remote Presentation) |
| 12:30 | **Lunch on your own (90 minutes)** |
| 2:00-3:30 | **Session 11: Early American Instruments**<br>Chair: Darcy Kuronen<br>♦ **The Theology, Utility, and Aesthetics of Using Musical Instruments in Early American Psalmody**<br>Maxine Fawcett-Yeske<br>♦ **The Early Piano in America, 1745–1810**<br>Thomas Strange<br>♦ **An Ancient American Piano with Clues About Piano Origins**<br>John Watson |
| 3:30 | **Coffee Break (25 minutes)** |
| 4:00-5:00 | **Session 12: Electronic Instruments, Part 3**<br>Chair: Sarah Deters<br>♦ **The Radio as a Musical Instrument: Five Composition Practices from Electronic Music**<br>Thom Holmes (Remote Presentation)<br>♦ **The Ondes Martenot: A Brief History and Contemporary Design Trajectory in Review**<br>David Kean |
| 5:00-6:30 | Free time |
| 6:30 | **Banquet cocktail reception (Soundscapes)** |
| 7:00 | Doors open to Performance Hall |
| 7:30 | **Banquet** |

# ALTERNATIVE FINGERBOARD SPECIES: QUANTIFYING SUBSTITUTIONS FOR DIMINISHING TRADITIONAL SPECIES

**Brian Applegate**

**Background**

The choice of woods used by luthiers has remained relatively unchanged over the last two centuries (Wegst 2006, 1439). Since the inception of the modern classical guitar, most often attributed to Antonio de Torres, the woods for specific guitar components have been standardized through tradition, expectation, and suitability to purpose. Spruce (*Picea spp.*) has remained the preeminent soundboard choice dating back to time immemorial while the tropical hardwoods of ebony (*Diospyros spp.*), mahogany (*Swietenia spp.*), Spanish cedar (*Cedrela odorata*), and rosewood (*Dalbergia spp.*) supplanted the temperate hardwoods of Europe once trans-oceanic trade was established with India, Africa, and the New World at the onset of the sixteenth century. From the Torres era onward the guitar in its apex was typically constructed of a spruce soundboard, Brazilian rosewood (*Dalbergia nigra*) back and sides, mahogany or Spanish cedar neck, and ebony or rosewood fretboard and bridge (Sparks 2002, 15). Unfortunately, in the words of B. C. Bennet, "Late 19th century and early 20th century guitars read like an endangered species list" (2016, 51). Indeed, the overutilization of tropical hardwoods has led to the complete ban of harvest for Brazilian rosewood through the Appendix I listing by the Convention on International Trade of Endangered Species (CITES) in 1992. Subsequently, Honduran mahogany (*Swietenia macrophylla)* and Spanish cedar were listed in CITES Appendix II restricting harvest and trade from certain geographic areas. More recently, in 2017, all rosewood species beyond Brazilian were also listed in CITES Appendix II. While only the ebonies from Madagascar are currently listed in CITES Appendix II, the other commercial ebonies traditionally used in luthiery are currently listed by the International Union for Conservation of Nature (IUCN) as either "Vulnerable", "Endangered", or "Critically Endangered" (IUCN 2020).

While there is an established body of science concerning the vibratory aspects of luthiery, very little research has been directed at other structural components such as necks, bridges, and fingerboards (Liu et al. 2020, 1). But as the timbers that have traditionally been used for these functions become more, if not completely, unavailable, potential species must be vetted to ensure at the very least a like-for-like substitution in terms of physical properties (Gore 2011, 5). And due to the fact that both luthiers and players hold traditional woods to an iconic status, the acceptance of substitutes will require empirical evidence as to equitability; best case scenario would demonstrate substitution superiority to create demand for substitutes rather than just acceptance. Even so, the potential for acceptance of substitution is further mitigated by the human nature demand for that which is rare (Fouihle, Houssay, and Bremaud 2012). For example, according to Annah Lake Zhu in "China's Rosewood Boom: A Cultural Fix to Capital Overaccumulation", rosewoods have become the number one illegally trafficked endangered species (2020). The demand for rosewood furniture by the "nouveau riche" in China accounts for nearly 90% of the illegal trade in the various Dalbergia spp. (Zhu 2020, 281). Zhu attributes China's "insatiable demand for rosewood" as a means by which rising cultural circles could demonstrate "prestige" and "sophistication" (Zhu 2020, 284). Similarly, the woods used as guitar components are often chosen out of the allure to own something rare and not necessarily according to purpose superiority. In other words, the extrinsic value of the instrument is partly determined by the woods from which it is made (Carcagno et al. 2018, 3535). Guitar makers have long used material selection to help distinguish between their various lines. While rosewood fingerboards are usually employed on high-quality instruments, ebony is usually selected for manufacturers' top-of-the-line models. Low-end instruments, conversely, often employ a black dyed or painted whitewood in the attempt to emulate the standard expectation of a dark wood (Fouihle, Houssay, and Brémaud 2012, 2) (Gore 2011, 16).

There is a growing body of research that contends the name of the species is less important

than the specific properties of a given wood sample (Gore 2011) (Gore and Gilet 2011) (Carcagno et al. 2018) (Somogyi 2009a), (Wegst 2006) (Fouihle, Houssay, and Brémaud 2012) (Haines 1979). This contention is well explained by Gore and Gilet with the following observation:

> It must never be forgotten, however, that even in highly select "good" tonewoods, the within-species variation in material properties can range up to a factor of two, emphasizing the importance of the materials you select. (2011, 4)

Therefore, when considering materials for the fingerboard it behooves the luthier to first identify the properties of importance for that specific function and test the prospective specimen to ensure it satisfies a threshold of acceptability. Furthermore, by first establishing benchmarks vis-à-vis tried-and-true species, potential substitution species can be compared on a macro level to determine general suitability. Specific specimens can then subsequently be vetted for selection.

**Properties of Importance**

There is general consensus between published academic research and practical luthier treatises as to the material properties to consider when selecting wood for an instrument fingerboard. The structural properties of mass, stiffness, surface hardness, moisture stability, and compression strength are found throughout (Somogyi 2009a) (Gore and Gilet 2011a) (Sloane 1966) (Benedetto 1994) (Young 1975) (Liu et al. 2020). The specific implication of each property is as follows.

1. **Mass:** The mass of the fretboard has two separate implications to consider in terms of use as a fingerboard. First, because the fretboard exists as component of the neck system, the ergonomics of guitar balance is affected by the total mass of the neck versus the total mass of the instrument body. This is particularly true of guitars being played in a seated position. The instrument as a whole needs to be balanced so that note and chord fingering is not hindered by any necessity to support a neck-heavy instrument. Second, and in contradiction to the first implication, a higher mass neck-unit provides greater inertia to string vibration. High inertia will resist string energy loss at the neck and allow more energy to be supplied to the vibrating soundboard (Somogyi 2009a, 155). The goal then would be to strive for the highest mass neck-unit that maintains a balanced feel for the musician. Factors such scale length and neck dimensions will further impact this consideration.
2. **Stiffness:** As a structural part of the neck-unit, fingerboard stiffness contributes to the resistance of string tension that could potentially deform the fingerboard plane and make the instrument unplayable. Steel-string guitars exert upwards of 90 kg of tension that would cause a neck of insufficient stiffness to bow. Lower-tensioned classical guitar necks are also susceptible to this as they do not employ the adjustable truss-rod commonly found in steel-string guitars. In addition, higher neck stiffness will increase the mechanical impedance of string energy to preserve it for soundboard admittance (Fletcher and Rossing 1998, 119-120) (Somogyi 2009a, 242). This, of course, assumes the intent to preserve string energy rather than damping it out of the vibratory system. Stiffness is measured by determining the Young's modulus.
3. **Surface Hardness:** The fingerboard is subject to the abrasive effect of pressing strings against its surface. While this condition is of greater impact with non-fretted fingerboards, fretted instruments are also susceptible depending on fret height and the force with which a musician frets a note. Surface hardness is measured by a Janka score; the force that it takes to "embed an 11.28 mm steel ball into the wood to half its diameter" (Meier 2016, 41). The Janka is usually reported for a species rather than a specific specimen as this is a destructive process that renders the sample useless for further utilization. In addition to offering a published Janka score for each species, this paper also offers an alternative method to measure hardness using a pin Durometer. The Durometer is traditionally employed in testing surface hardness of plastics, rubber samples, and hardwood flooring.
4. **Moisture Stability:** Wood dimensional stability in changing humidity environments is important due to primarily three factors. First, dimensional changes in the longitudinal direction can cause deformation in fingerboard plane. Specifically, moving the instrument to a

high humidity environment will cause the outer wood fibers to swell leading the fretboard to bow backwards, while moving to a low humidity environment causes the fibers to shrink causing it to bow forwards. These ramifications are more detrimental to guitars absent of an adjustable truss rod, which is used to compensate for these deformations. Second, radial dimensional changes can cause issue with fret ends. In low relative humidity environments, the width of the fingerboard will shrink while the length of a fret remains fixed, causing sharp fret edges to protrude past their usual boundary. Finally, dimensional fretboard expansion and contraction can cause lacquer finish adhesion issues at the seam between the fretboard and the neck. This issue is exacerbated when the shrinkage coefficient for the fretboard wood species is decidedly different from that of the neck wood species. Often times a witness line is visible in the lacquer finish with moderate humidity changes. Under more severe conditions the guitar finish will crack along the fingerboard neck joint. It would be impractical to test individual wood samples for compression moisture stability, necessitating reliance on published averages for a species.

**5. Compression Strength.** Sometimes referred to as "crushing strength", compression strength measures wood fiber strength in the longitudinal direction (Meier 2016, 41). This metric is particularly important when barbed frets are seated in fret-slots. A low compression strength suggests the wood fibers would be damaged in this process, leading to possible fret failure, i.e. frets falling out of their slots. It would be impractical to test individual wood samples for compression strength, necessitating reliance on published averages for a species.

**Fingerboard Candidates**

Table 1 details published material properties for the five fingerboard candidates and Honduran mahogany (Meier 2016). Honduran mahogany was added merely to demonstrate moisture stability compatibility.

Historically, various ebonies and Brazilian Rosewood were the preferred species used for fingerboards. Once Brazilian Rosewood became unavailable, Indian Rosewood became its de facto substitute (Gerken et al. 2003, 44-45). Hard Maple came to prominence with the single-piece neck and fretboard design employed by Leo Fender on his electric guitars of the early 1950s (Balmer 2009, 11). Species specific observations based on the data in Table 1 and conventional wisdom are as follows:

| Species | Specific Gravity ($g/cm^3$) | Janka (N) | Young's Modulus (GPa) | Compression Strength (MPa) | Radial Stability % | IUCN Status |
|---|---|---|---|---|---|---|
| Hard Maple (*Acer saccharum*) | .71 | 6,450 | 12.62 | 54.0 | 4.80 | N.A. |
| E.I. Rosewood (*Dalbergia latifolia*) | .83 | 10,870 | 11.50 | 59.7 | 2.70 | V |
| Gaboon Ebony (*Diospyros crassiflora*) | .96 | 13,700 | 16.89 | 76.3 | 8.30 | V |
| Granadillo (*Platymiscium spp.*) | .95 | 12,030 | 19.56 | 80.7 | 2.80 | N.A. |
| Katalox (*Swartzia cubensis*) | 1.15 | 16,260 | 25.62 | 105.1 | 3.90 | N.A. |
| Honduran Mahogany (*Swietenia macrophylla*) | .59 | 4,020 | 10.06 | 46.6 | 2.90 | V |

*Table 1. Published hardwood properties for tested species.*

**1. Hard Maple** is the least expensive species in the list. However, its material property scores are the lowest in every category except slightly besting East Indian Rosewood in terms of Young's modulus. Nonetheless, Hard Maple remains a popular fingerboard for electric guitars, primarily.

**2. East Indian Rosewood** is currently the most common species used for guitar fingerboards. Major instrument producers have relied on East Indian Rosewood due to its availability, low cost, and dark appearance, which coincides with consumer expectation for a fingerboard wood. Unfortunately, overutilization by various end-users has resulted in a CITES Appendix II and IUCN VULNERABLE listing. Its mechanical properties are towards the lower end of the species listed in Table 1. However, once seasoned, East Indian Rosewood

demonstrates a moisture stability at the lower end and similar to that of Honduran Mahogany.

**3.** West African **Gaboon Ebony** is typically used on the top-line offerings of most luthiers. *D. crassiflora* exhibits the consistent jet-black appearance both consumers and luthiers expect to see on a high-end instrument. According to the metrics in Table 1, Gaboon Ebony scores towards the average of the species listed for most categories and, surprisingly, worst in terms of moisture stability. Nonetheless, Gaboon will likely remain the preferred choice for high-end instruments as long as visual aesthetic remains the prevailing determining factor.

**4. Granadillo** is a relative newcomer to the art of luthiery. As a tonewood it has been touted by Taylor Guitars as being very similar to East Indian Rosewood (Taylor 2020). Most luthier wood supply firms are now offering Granadillo as a "sustainable" alternative to threatened rosewood species. Judging by the material properties in Table 1, the *Platymiscium spp.* holds promise as a fingerboard wood, even superior to ebony in terms of Young's modulus, compression strength and moisture stability.

5. Due to the dark color of **Katalox,** this species is often referred to as Mexican Ebony, even though it is not a *Diospyros spp.* Indeed, between its near black coloration and reported mechanical properties, Katalox may in fact be the best prospect for a fingerboard. Additionally, the advertised price by Luthiers Mercantile International for a first grade Katalox fingerboard is about half the cost of a Gaboon Ebony fingerboard (LMII.com 2020).

**Scope of Testing**

As previously pointed out, there is no practical means to test individual samples for compression strength and moisture stability. Therefore, data for these properties relies on published figures to indicate wood sample attributes for the sake of comparison and achieving a threshold based on traditional fingerboard species. Mass, stiffness, and surface hardness, however, can be accurately measured using the methods outlined below. The compilation of the metrics will provide a basis to compare the suitability of tested woods for the application of a fingerboard. Mass was measured in terms of density, g/cm$^3$. Stiffness is considered only in the longitudinal direction as this is the primary strain on the fingerboard due to string tension. Surface hardness testing was an average of Durometer readings at three different sample locations. All tested samples were dimensioned to 6.35 mm x 68.5 mm x 482.5 mm. These dimensions were chosen simply to ensure the samples could be subsequently used as guitar fingerboards. The samples were procured from luthier supply companies that processed the wood with the intention of being used as high-quality instrument fingerboards. The wood was seasoned and tested in a climate-controlled space at an ambient temperature of 21° +/- 1° and relative humidity of 43%-47%. Specific tests were carried out in their entirety for all the species at a consistent climate to mitigate any disparity due to temperature and humidity factors.

**Testing methods**

**Mass** was measured using a jewelry scale. **Density** was calculated based on the dimensions of the specimen and measured in g/cm$^3$.

**Surface hardness** was tested using a Shore D-scale durometer. The durometer measures the depth of indentation made by 1.44 mm steel conical pin under 44.45 newtons of spring force. The corresponding D-scale is a dimensionless quantity that allows surface hardness comparisons (ASTM 2017). Because durometer testing is non-destructive, specific samples can be tested and subsequently used in manufacturing.

The **Young's modulus** in the longitudinal direction ($E_L$) was determined using a static center-point deflection rig as shown in Photo 1.

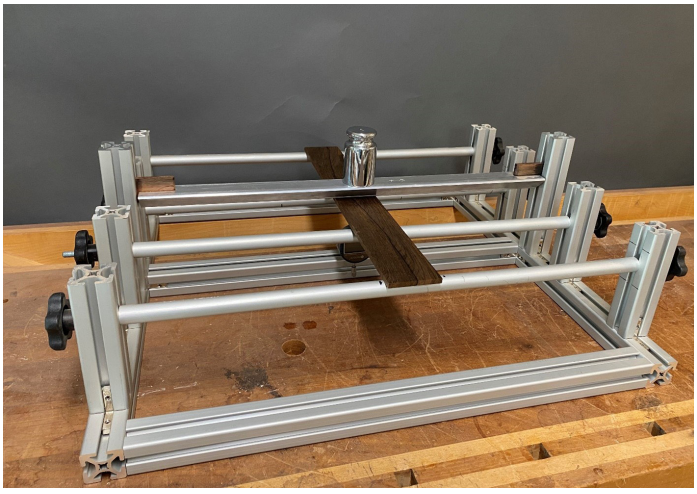


*Photo 1. Center-point deflection rig.*

The equations provided by elementary beam theory were used to determine $E_L$ based on the measured deflection of each sample in accordance to ASTM, JIS, and ISO standards (Yoshihara and Tsunematsu 2005, 29-30). This is a two-step process that first takes into consideration the cross-section of the sample as follows:

$$I = \frac{bh^3}{12} \quad (1)$$

where *b* is the measured base and *h* is the measured height. With *I*, the Young's modulus is calculated with:

$$E_L = \frac{FL^3}{48(\Delta)(I)} \quad (2)$$

where *F* is the mass of the applied force, *L* is the distance between end supports, and Δ is the measured deflection. The calculated Young's Modulus was recorded in gigapascals (GPa).

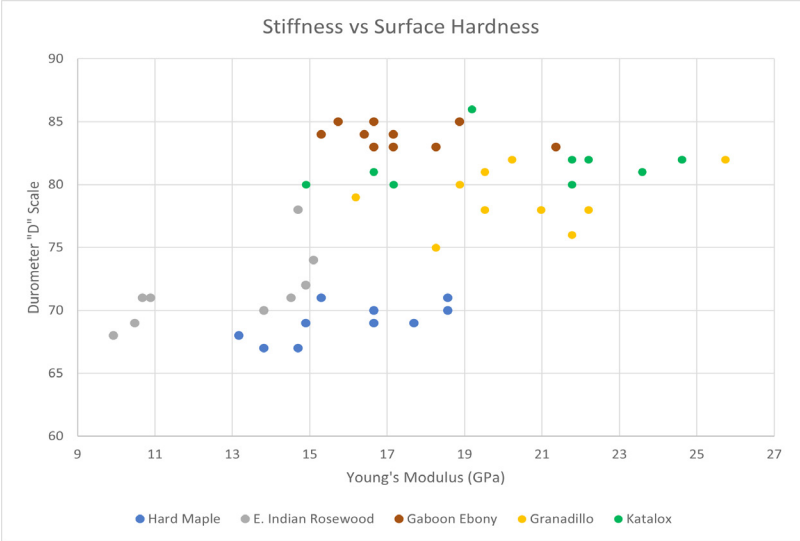
## Results and Discussion

Table 2 details the mean density, surface hardness, and Young's Modulus of ten samples for each of the five fingerboard candidates:

| Species | Density (g/cm³) | Durometer (D Scale) | Young's Modulus (GPa) |
|---|---|---|---|
| Hard Maple | 0.72 | 69 | 16.00 |
| E. Indian Rosewood | 0.74 | 72 | 12.99 |
| Gaboon Ebony | 1.15 | 84 | 17.36 |
| Granadillo | 0.99 | 79 | 20.32 |
| Katalox | 1.09 | 82 | 20.65 |

*Table 2. Tested mean values for five fingerboard species.*

In terms of density, the tested results concur fairly well with the published figures in Table 1 except for East Indian Rosewood and Gaboon Ebony which came in 11% lower and 20% higher, respectively. Other than Gaboon Ebony scoring slightly higher than Katalox, the surface hardness rankings produced using the durometer is consistent with the expectation established by published Janka scores. In terms of Young's Modulus, the major outliers from expectation were Hard Maple (+27%), and Katalox (-25%). Factors that might contribute to the differences between the published and tested figures are the relatively low sample size of ten specimens for each species, the growing environment from which the wood was sourced, and radical outliers that dramatically affected the calculated mean scores. To further investigate the specific characteristics of each sample, Plot 1 displays the tested results for the primary fingerboard functional properties of surface hardness and stiffness.



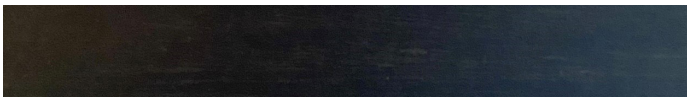

*Plot 1. Comparison of fingerboard samples in terms of stiffness and surface hardness.*

Immediately apparent in Plot 1 is the disparity of values demonstrated within species by all of the fingerboard candidates. This aspect demonstrates the importance of testing individual potential components rather than relying on published species' averages. Specific evaluation of each individual species is offered as follows:

1. **Hard Maple** generally scored the lowest in terms of surface hardness. This result is consistent with the expectation established by the published metrics. Surprisingly, in some cases maple scored as well as any species in terms of stiffness and generally scored better than East Indian Rosewood. Hard Maple proved itself to be a reasonable fingerboard candidate, especially if the surface can be protected by an abrasion-resistant surface finish, as is usually the case when used as an electric guitar fingerboard.

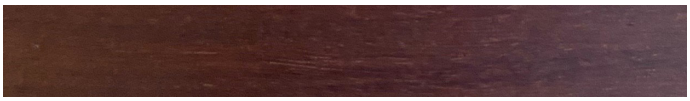
**2. East Indian Rosewood** scored the lowest in terms of stiffness in half of its sample set (the data point just left of the 11 GPa actually represents two identical specimens). Even the best samples barely approach the stiffness scores of Gaboon Ebony, Granadillo, and Katalox. This finding suggests East Indian Rosewood choice as a fingerboard wood should be questioned, especially in light of its threatened ecological status.

**3. Gaboon Ebony** demonstrated the most consistency in terms of surface hardness and stiffness. It should be noted that the samples used came from a singular supplier that procures their timber from a singular location in Cameroon. Its high scores relative to East Indian Rosewood substantiates its preference in use for high-end instruments, particularly when a jet-black visual aesthetic is a contributing consideration.



**4. Granadillo** exhibited a wide disparity of both surface hardness and stiffness. Nonetheless, its surface hardness with every sample tested better than East Indian Rosewood. In addition, its stiffness scores were generally higher than those of Gaboon Ebony. With testing and selection, Granadillo could prove itself to be a superior fingerboard wood to East Indian Rosewood in both surface hardness and stiffness. In addition, its dark-brown appearance is similar to East Indian Rosewood to satisfy any penchant for that visual aesthetic.

**5. Katalox**, as with Granadillo, demonstrated vast disparity in individual scores. However, 50% of the samples tested displayed a stiffness score higher than the industry standard Gaboon Ebony. Furthermore, due to its natural near-black coloration, Katalox could be dyed to compare on visual aesthetic with the ebonies, a practice already done by manufacturers to enhance the darkness of streaky or mineral spotted ebony (LMII.com 2020).



**Conclusion**

The threats to the continued availability of traditional woods used for instrument fingerboards necessitate to the consideration of alternative species. With East Indian Rosewood restrictions and dwindling availability of Ebony, it is conceivable the two primary woods used for quality fingerboards may no longer be available for commercial use. The results of the testing contained herein demonstrated the viability of substitution for rosewood and ebony by species not referred to in a CITES Appendix or by IUCN threatened status. The testing also demonstrated the relatively low suitability of East Indian Rosewood for use as a fingerboard relative to Katalox and Granadillo. Katalox, in addition to its exemplary mechanical properties, contends well with ebony as far as visual aesthetic is concerned. Beyond the scope of this test, there are likely several other species that could also be considered as potential candidates based on their published material properties. And finally, the testing as a whole demonstrated the importance of considering wood samples on their individual material properties rather than on the published averages for the species. While the suitability of fingerboard woods can be assumed by published generalizations, they can only be confirmed through individual testing. And yet the greatest barrier to the acceptance of species substitutions comes from the traditional expectations of luthiers and consumers. The process to overcome these prejudices will likely include a body of research verifying the equivalence, and possible superiority, of alternative woods. Conventions in guitar construction come as the result of centuries of tradition. It will undoubtedly take a vast body of research to overcome long-held convictions.

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# BIDDING FAREWELL TO BELOVED FRIENDS:
## THE ABEL COLLECTION OF MUSICAL INSTRUMENTS GOES TO AUCTION

**Geoffrey Burgess and James B. Kopp**

*Figure 1. Dick Abel on his last visit home, still taking delight in one of his treasured oboes. Jeannine is in the background sorting papers.*

In early December 2021 the Skinner Auction House in Marlborough, MA held an on-line auction of over 270 musical instruments, a large percentage of which came from the collection of former AMIS members Richard and Jeannine Abel. With its strong emphasis on woodwinds and particularly double-reed instruments, the Abel collection could without any exaggeration be described as the most important privately owned assemblage of oboes and bassoons in the US. The sale attracted buyers from around the world, and for the double-reed community provided a rare opportunity to see an important segment of their instruments' history laid out in full view.

Born on August 15, 1928, Richard W. Abel attended high school in Oakmont, PA where he learned oboe. He played in the Pittsburgh Youth Symphony Orchestra, and he also took up bassoon. In June 1952, he graduated from the University of Pittsburgh School of Dentistry and the same month married Laura Jeannine English. Five years younger than Dick, Jeannine had moved to Pennsylvania from East St. Louis, IL with her family when she was young, and attended schools in what is now the Bethel Park section of Allegheny County. When she married Dick, she was in her final year of a Bachelor of Arts degree in Applied Music at Chatham College, Pittsburgh. She later received a Diploma from the Royal Conservatory of Music, Toronto, in vocal performance. Upon graduation, Dick entered the United States Army Dental Corps, and when his service terminated in October 1955, the couple moved to Franklin, PA where, with Jeannine's help, Dick established a dental clinic which he operated up to 1990.

Dick and Jeannine both kept active with interests ranging across medical and musical professions, but always with a keen sense of community engagement. Dick served on the boards of the American Red Cross, the Vanango County Dental Society, Franklin Silver Cornet Band, the Franklin Civic Operetta Association, and Kiwanis. He helped start the Venango Museum of Art, Science, and Industry in Oil City, overseeing the restoration of the Wurlitzer theater organ that the museum rescued from the Latonia Theatre. He played first oboe in the Clarion State College Symphony Orchestra in 1968, and went on to be Principal Oboe of the Allegheny Civic Symphony (1982–95). He was also a regular with the Franklin Civic Operetta Association, of which he was also a supporting member. In the late '80s and into the '90s he taught oboe at Allegheny College, and was a member of the Allegheny Wind Quintet with Bronwell and Robert Bond on flute and clarinet, Carolyne Wallace on bassoon, and Jones Miller on horn. He was a founding member of the Venango Chamber Orchestra which was recognized as an important addition to the community with a WQED–Dominion Foundation grant in 2002. The next year Dick was named Man of the Year by the Franklin Area Chamber of Commerce.

Meanwhile, Jeannine taught flute, piano, and voice, and was adjunct voice faculty at Allegheny College in Meadville, PA. Her voice, described in a review in the Pittsburgh Press from 1983 as "lovely, disciplined," was well suited to early repertoire. She loved to program Bach and Purcell, but her

faculty recitals often included songs by Stravinsky and Menotti. A regular soloist with choral societies and orchestras in northwestern Pennsylvania, Jeannine made appearances as soloist with the Erie Philharmonic from 1968, and was a regular with the Meadville Chorale in the '80s. In 1988 she helped organize the Vermont Music and Arts Association's Summer Festival, and her involvement in community theater included serving as both music and stage director for productions of *Sound of Music*, *Guys and Dolls*, and *The King and I* for amateur music-theatre groups in Franklin and nearby Oil City.

The couple were also interested in early music, and were members of the Antiqua Players that Pittsburgh University music professor Colin Sterne (1921–2008) had founded around 1960 to explore music of the pre-Bach era. Jeannine toured to Britain with the group in 1965, and in 1970 she gave a lute-song recital with visiting Belgian lutenist Michel Podolski, at the time recognized as the foremost exponent of his instrument.

The Abels' interest in early music naturally led to collecting historical specimens of their instruments: flutes for Jeannine; oboes and bassoons for Dick. They were both active and valued members of the American Musical Instrument Society, served as the business managers of the society's journal from 1979 to 1982, and Jeannine as the secretary of the Board of Governors for the decade beginning 1992.

Their home outside Franklin was surrounded by farmland and backed onto the woods around the Beatty Run stream. Dick converted the garage into a workshop where he carried out intricate repairs on his antique woodwinds; on the other side of the house was Jeannine's empire—a dedicated greenhouse for her orchids. In 2003, when Dick suffered a decline in health, they relocated to the Masonic Village at Sewickley, close to Pittsburgh. Their new home on Scottish Rite Lane was close to expert medical care, and still had space for their extensive musical-instrument collection. They remained there until they passed away: Dick on May 30, 2012, and Jeannine on July 8, 2021.

Even after suffering a stroke, Dick was a caring and dedicated oboe teacher. But what gave him the greatest delight was the opportunity to share his "babies" (his term for his antiques) with interested colleagues. He had a passion for French oboes, with a particular focus on the Triebert–Lorée lineage. He amassed an impressive and almost complete documentation of the instrument's development across much of the nineteenth century. There were 5 oboes and a musette by Guillaume Triebert, 12 oboes by his son Frédéric, 7 by Triebert's successor Couesnon, including a rare baritone oboe with boot joint; 11 Lorée oboes in rosewood, palisander, and grenadilla, the youngest dating from the 1970s the oldest from as far back as 1885, each with a different key system, 3 Lorée English horns, and one oboe d'amore from 1989 (fetching the highest price of the oboes).

*Figure 2. A selection of Triebert oboes from the Abel Collection.*

Some of his most treasured pieces were an oboe and an exceptionally rare *cor anglais moderne* by Henri Brod (Fig. 3), a range of Boehm-system oboes, and a beautiful oboe and English horn in figured boxwood by the German company Berthold und Söhne of Speier. Dick proudly displayed this last pair alongside the photo of his oboe on Fritz Reiner's recording of the *Domestic Symphony* (see Fig. 4).

*Figure 3. Oboe and cor anglais moderne by Henri Brod. Skinner auction lots 1142 and 1222.*

He also owned a veritable forest of over thirty English horns, in addition to Henri Brod's redesigned English horn with contracted straight body and a long serpentine bocal. The tenor oboes also included curved *cors anglais* by Triebert and Meyer, one in angular form by the nineteenth-century

Viennese maker Stephan Koch, a late example of a 2-keyed tenor oboe by Winnen of Paris, and a *vox humana* (probably English) from late eighteenth century.

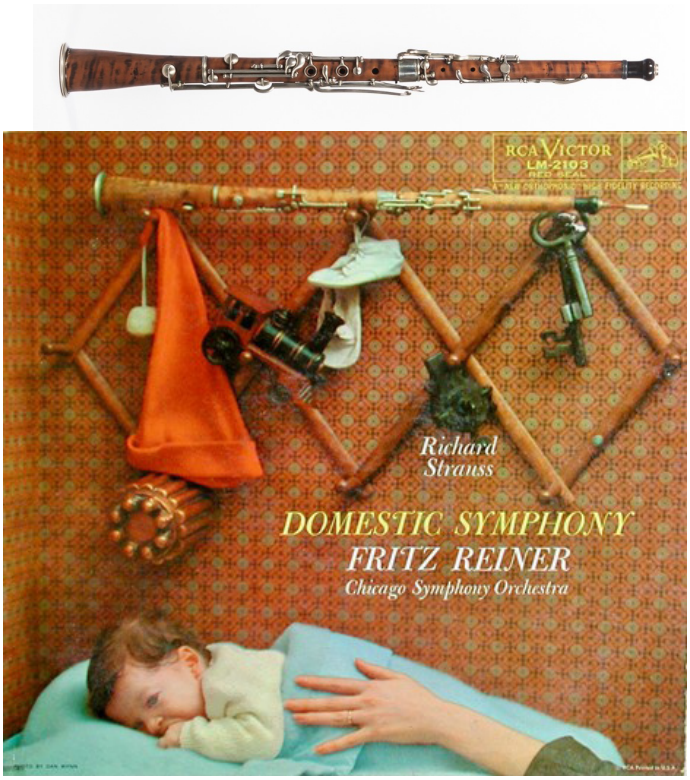


*Figure 4. Berthold oboe from the Abel Collection. Skinner auction lot 1120. The same oboe featured on a record sleeve from 1950.*

As well as collecting instruments from other French workshops, such as Buffet-Crampon, Barbier, Cabart, Guy Humphrey and Selmer, Dick was not averse to taking in strays from other traditions. He had oboes by Heckel and Kohlert, Albert of Brussels, the Milanese firm of Maino and Orsi, and from the USA, G.L. Penzel and Bro. of New York from the 1890s and early twentieth-century oboes stamped Conn, as well as more obscure makes with no indication of maker or origin.

Dick was also fascinated by reeds and reed making equipment. He collected gouging machines including one by Triebert, and wherever he could, preserved historic reeds along with the instruments.

Bassoons made by any of the oboe makers named above seemed to catch Dick's eye. Among the thirty-two bassoons in the Abel collection were several by Triebert and one signed by Marzoli, who was Triebert's bassoon specialist from 1853 to 1862 (Fig. 5), as well as several early examples by Buffet Crampon. Earlier French examples included several by F.G. Adler and J.N. Savary jeune, including tenoroons by each, and one bassoon each by Savary père, dated 1818, and Clair Godfroy aîné. From the English tradition there were bassoons by William Milhouse, Thomas, Key, John Köhler, John Pask, Hawkes & Son, and Goulding, Wood & Co. The keys of a bassoon by Ignz Huittl of Graslitz, dated c. 1800, were mounted on raised wooden blocks, by then an archaic practice. Among several bassoons by Wilhelm Heckel, the latest, no. 5079, fetched $10,000 (including commission), the most of any bassoon in the sale. Other bassoons were by Maino & Orsi, Oscar Adler, Vinzenz Püchner, and Mirafone.

*Figure 5. Bassoon stamped Marzoli/Paris, c. 1860. Skinner auction lot 1261.*

Many of the instruments were bought through dealers around the world; others were acquired directly from the manufacturer, or through the happenstance of antique markets or trade with other collectors. The Abels were drawn to off-beat and instruments. Their fireplace in Franklin was adorned with twin serpents. The *contrabasso a ancia* by Maino and Orsi, a bass ophicleide, and bass and soprano sarrusophones, a silver presentation fife by Elbridge G. Wright from 1862 (see Fig. 6), and a pair of harps speak to the Abels' eclectic musical interests. One item of particular interest was the sixteenth-century Italian virginal that had been featured in concerts of the Antiqua Players (see Fig. 8).

Dick always welcomed anyone who had a sufficiently arcane fascination in the emergence of the modern oboe, or the history of the French bassoon, and generously gave permission for some of his unique specimens to be featured in *The Oboe*


*Figure 6. Presentation fife by Elbridge G. Wright from 1862. Skinner auction lot 1075.*

by Geoffrey Burgess and Bruce Haynes (Yale University Press, 2004). Entrusted to his wife after Dick passed away, the collection remained largely intact, with just a handful of sales to enthusiasts. Of Jeannine's flutes that remained (those that Dick didn't "suggest" that she sell so that he could have some extra pocket money to spend on his oboes!) there were numerous nineteenth-century specimens, a unique model by Boehm and Mendler dated Munich 1875, Haynes flutes from the 1940s, and many band flutes and fifes.

Dick wasn't as particularly fond of his clarinets, even though he should have been! Among the 26 instruments was an exceptional example of a basset horn by the Berlin firm of Griesling and Schlott from 1820 which fetched the auction's top bid of over $26,000 (Fig. 7), and miscellaneous curiosities including a conical-bored tarogato, and an octavin. Another item that was probably a "must have" for Dick was a very rare (and possibly unique) B-flat clarinet stamped "Abel's, Northampton," from c. 1825 (Skinner Lot 1102). The only other known instrument with a similar mark is a one-key boxwood piccolo "Abel and Sons, Northampton" in the Musée de la Musique, Paris.

*Figure 7. Basset horn by Griesling and Schlott from 1820. Skinner auction lot 1112.*


*Figure 8. Undated publicity photograph of The Antiqua Players. L to R: Roberta and Colin Sterne, Karl Neumann. The virginal in the center of the image was part of the Abel sale (lot 1056). (Courtesy Jessica Wood, New York Public Library Music Division).*

Although now dispersed, the Abels' legacy will live on in collections around the world, where their enthusiastic collecting can be appreciated by many, and provide the resources for much further study. To see the full sale, visit the auctioneer's site https://www.skinnerinc.com/auctions/3867T. The Abels' ancillary documentation, including catalogues, descriptions and photo files, and provenance history will be lodged in the AMIS archive.

# 2022 AMIS AWARDS

**The American Musical Instrument Society takes pleasure in announcing the following awards for 2022:**

The **Curt Sachs Award,** the Society's highest award, honors lifetime contribution toward the goals of the Society—to promote the understanding of all aspects of the history, design, and use of musical instruments in all cultures and from all periods.

*Steward Carter*

The recipient of the 2022 Award is Stewart Carter. Dr. Carter is a tireless editor, author, and scholar in the fields of musical instrument research and practice. He is past president of AMIS and a founding member of the Historic Brass Society as well as the long-time editor of that society's Journal. Among his publications is *The Trombone in the Renaissance: A History in Pictures and Documents* (Pendragon Press, 2012). He has edited the *Performer's Guide to Seventeenth-Century Music* (1997, 2nd ed., 2012), two volumes of *Brass Scholarship in Review* (Amherst, 1995 and Paris, Cité de la musique, 1999), and the journal *Historical Performance.* His numerous articles contribute to scholarship on the trombone and the trumpet, performance practice, the Gütter family of wind instrument makers, and lip-blown aerophones around the world.

The **Nicholas Bessaraboff Prize** is awarded annually for the best book-length publication in English that furthers the goals of the Society. The 2022 Bessaraboff Prize is awarded to Matt Brennan for *Kick It: A Social History of the Drum Kit* (Oxford University Press, 2020).

*Matt Brennan*

*Kick-It* is a lively history of the drum kit or drum set and its players, focused on drumming and being a drummer. "Equally illuminating and entertaining, *Kick It* showcases the cross-disciplinary relevance and far-reaching potential of organology."

Matt Brennan is Reader in Popular Music at the University of Glasgow, where he also directs the Interdisciplinary Music Industries Research Group (IMIRGe). His other publications include *When Genres Collide* (Bloomsbury, 2017), which earned numerous accolades, and *The History of Live Music in Britain*, of which he was a co-author (Ashgate, 2013; Routledge, 2019, 2021). He is an editor of the Bloomsbury series *Alternate Takes—Critical Responses to Popular Music*; he has also served as chair of the UK and Ireland branch of the International Association for the Study of Popular Music (IASPM).

The **Frances Densmore Prize** is awarded annually for the best article-length publication in English that furthers the goals of the Society. The 2022 Densmore Prize is awarded to Amine Beyhom for his article "Was the Early Arabian ʻŪd 'Fretted'?" published in *Near-Eastern Musicology Online* 5, no. 9 (November 2020).

*Amine Beyhom*

"Was the Early Arabian ʻŪd 'Fretted'?" is "an erudite and impressive piece of scholarship. The author persuasively demonstrates that the early ʿūd was unfretted but that tie-frets may have been used for teaching or training purposes. Beyhom's argument has important implications for not just Islamic and Western organology but indeed for the critical work of recognizing early Arabian treatises on praxis as central to the development of Greek and, therefore, to the development of European musical systems. The extraordinary analysis of primary source material that made this article stand out within a strong field of candidates exemplifies crucial considerations in organology, musicology, and music theory today."

Amine Beyhom trained as a civil engineer as well as a musician (guitars and bass) and a composer. After obtaining his MA from the École Nationale des Ponts et Chaussées (ENPC) in Paris, he worked as a research engineer in France, then changed the course of his life to become a professional musician and composer, firstly in France then in Lebanon, while learning the ʿūd and founding his own music production company. He completed his PhD in 2003 at the Sorbonne University, Paris, and his Habilitation at the same university in 2010. He later received the title of Professor in Music and Musicology.

Dr. Beyhom has published articles on numerous topics including Byzantine chant, the theory of music, and Orientalism in musicology. He has taught at universities in Lebanon and France, and in 2011 he founded the Centre for Research on the Music of Arabian and Akin countries (CERMAA), which he still leads. In 2018 he established VIA-MAP (the Video Animated Music Analysis Project), which has produced more than sixty video analyses. He was awarded the Lois Ibsen Al-Faruqi triennial Award by the Society for Ethnomusicology in 2017. He is active as a music analyst and videographer, as Chief Editor of Near-Eastern Musicology Online, and as the head of the CERMAA research center. He is delighted to conduct workshops with international students on various themes, the last to date (before Covid) being about Artificial Intelligence and Music.

## IN MEMORIAM: DON SARLES

### 1939-2021

Don was born in Laurel, MD, in 1939. He graduated from Johns Hopkins University with a degree in electrical engineering, and he served in the Navy from 1964 to 1967 as electrical officer on the USS Fort Snelling. Later, he worked for the engineering firm of Syska and Hennessey and then worked until retirement for the Architect of the Capitol in Washington, DC. He is survived by his wife, Carolyn Bryant.

Don attended his first AMIS meeting in 1995 (Salt Lake City) and gradually became a regular presence. His musical interests were wide ranging, and he was an attentive audience member, especially interested in presentations about instrument building. He was always a great guy to talk to. Beginning in 2011, Don worked behind the scenes as AMIS Registrar, and we are all most grateful for his organizational skills and for his support of the society.