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John Chowning was born in Salem, New Jersey, in 1934. Following military service he studied music at Wittenberg University where he concentrated on composition and received a BMus degree in 1959. He then studied composition in Paris for three years with Nadia Boulanger. In 1966 he received the doctorate in composition from Stanford University, where he studied with Leland Smith. With the help of Max Mathews of Bell Telephone Laboratories and David Poole of Stanford, in 1964 he set up a computer music program using the computer system of Stanford's Artificial Intelligence Laboratory. This was the first implementation of an on-line computer music system ever. Beginning in 1964, he built a program that allowed the simulation of moving sources in a quadraphonic projection. In 1967, Chowning discovered the frequency modulation (FM) algorithm in which both the carrier frequency and the modulating frequency are within the audio band. This breakthrough in the synthesis of timbres allowed a very simple yet elegant way of creating and controlling time-varying spectra. Over the next six years he worked toward turning this discovery into a system of musical importance. In 1971 he made a significant advancement based upon analytical research of Jean-Claude Risset and Max Mathews at Bell Telephone Laboratories. Stanford University began a relationship with Yamaha in Japan in 1973, which led to the most successful synthesizer engine in the history of electronic musical instruments.

John Chowning has received fellowship grants from the National Endowment for the Arts and was artist-in-residence with the Künstlerprogramm des Deutschen Akademischen Austauschdiensts for the City of Berlin in 1974, and guest artist in IRCAM, Paris in 1978-79, in 1981, and in 1985. His compositions have been widely performed around the world and have been recorded on compact disc. In 1983 he was honored for his contributions to the field of computer music at the International Computer Music Conference in Rochester, New York. In 1988 he was elected a fellow of the American Academy of Arts and Sciences. He was awarded the Honorary Doctor of Music by Wittenberg University in 1990. The French Ministre de la Culture awarded him the Diplôme d'Officier dans l'Ordre des Arts et Lettres in 1995 and he was awarded the Doctorat Honoris Causa in 2002 by the Université de la Méditerranée and by Queen's University, Belfast, 2010. He was named Laureate of the Giga-Hertz-Award in 2013. Beginning in 1966 Chowning taught computer-sound synthesis and composition at Stanford University's Department of Music and was the founding director in 1974 of the Center for Computer Research in Music and Acoustics (CCRMA), one of the leading centers for computer music and related research.

## Curriculum Vita

John MacLeod Chowning

Born: August 22, 1934 in Salem, New Jersey

### Education:

Navy School of Music and Military Service, 1952-55.

BM (Bachelor of Music) Wittenberg University, Springfield, Ohio, 1959.

Studies in composition and theory with Nadia Boulanger, Paris, 1959-62.

MA, (Music Composition) Stanford University, 1962-1964.

DMA (Doctor of Musical Arts) Stanford University, 1966.

### Employment:

Assistant Professor of Music, Stanford University, 1966-1972.

Adjunct Professor of Music and Director of the Center for Computer Research  
in Music and Acoustics (CCRMA), Stanford University, 1975-1979.

Professor of Music and Director CCRMA, Stanford University, 1979-1996.

Professor of Music, Emeritus, 1996

### Awards, Honors, and Professional Societies:

- IBM Graduate Fellowship, 1964-1965.
- Stanford Wilson Fellowship, 1965-1966.
- National Endowment for the Arts, Fellowship Grant, 1973.
- Guest Artist, City of Berlin, German Academic Exchange Service (DAAD) 1974-1975.
- IRCAM Commission, Paris, 1977, *Stria*.
- Invited Composer, IRCAM, Paris, 1978-79.
- IRCAM Commission, Paris. February 1981, *Phonē*.
- Honored Composer, International Computer Music Conference, Rochester, NY, Oct 1983.
- Guest Composer. IRCAM, Paris, 1985.
- Honored as “Man of the Year”, Yamaha International Corporation, Los Angeles, 1986.
- Elected Fellow of American Academy of Arts & Sciences, 1988
- Honorary Doctor of Music by Wittenberg University, 1990
- Osgood Hooker Professorship in Fine Arts, Stanford University, 1992.
- Diplôme d’Officier dans l’Ordre des Arts et Lettres, The French Ministre de la Culture, 1995
- Doctorat Honoris Causa, Université de la Méditerranée in Marseille, 2002
- Doctorat Honoris Causa, Queen’s University, Belfast, 2010
- Laureate of the Giga-Hertz-Award 2013
- Doctor of Musicology Honorary. The Hamburg University of Music and Theaters, 2016

### Compositions:

*Sabelithe* - Computer generated 4-channel tape , first performance: Stanford University, May 1971.

*Turenas* - Computer generated 4-channel tape , first performance: Dinkelspiel Auditorium, Stanford University, April 28, 1972.

*Stria* - Computer generated 4-channel tape , first performance: Centre Pompidou/IRCAM, October 1977.

*Phonē* - Computer generated 4-channel tape, first performance: Centre Pompidou/IRCAM, February, 1981. La première audition aura lieu à Paris à la Grande Salle du Centre Pompidou (de l'Ircam) dans le cadre du séminaire *Le Compositeur et l'ordinateur* proposé par Pierre Boulez du 17 au 21 février 1981.

*Voices v. 1* – Solo Soprano and interactive computer, first performance: Maureen Chowning, soprano, Salle Messiaen, Maison de Radio, Paris, March 12, 2005.

*Voices v. 2* – Solo Soprano and interactive computer, first performance: Maureen Chowning, soprano, Zellerbach Hall, University of California, Berkeley, March 29, 2006.

*Voices v. 3* – Solo Soprano and interactive computer, first performance: Maureen Chowning, soprano, Meany Hall, University of Washington, Seattle, April 27, 2011.  
–Invited performance: Amy Petrongelli, soprano, Tanglewood Festival of Contemporary Music, Ozawa Hall, August 4, 2011

### **Recordings:**

Computer Music of John Chowning, CD, *Sabelithe, Turenas, Stria, Phonē*, Wergo Recording Company, Schott, publishers, Germany, 1988.

IRCAM. 1983. "IRCAM: a portrait." Excerpts from *Stria*. Stereo phonograph record, Centre Georges Pompidou, Paris.

Ameneiro Alvarez, Manuel & Pottier, Laurent, *Turenas Live – Composition (1972) par John Chowning, Arrangement (2011) par Laurent Pottier pour 4 percussions et claviers, interprètes Rémi Houille, Léo Brossy, Martial Kaya et Sunghwa Lee*, DVD vidéo, réalisateurs Manuel Ameneiro Alvarez et Laurent Pottier, Saint-Etienne, PUSE, 2012, ISBN : 9 782862 726311.

### **Patents:**

METHOD AND APPARATUS FOR SIMULATING LOCATION AND MOVEMENT OF SOUND

Patent number: 3665105

Filing date: Mar 9, 1970

Issue date: May 1972

METHOD OF SYNTHESIZING A MUSICAL SOUND

Patent number: 4018121

Filing date: May 2, 1975

Issue date: Apr 19, 1977

### **Publications:**

Chowning, J., and L. C. Smith. 1970. Computer Music, Computers and the Humanities 4, 5 May.

- Chowning, J. 1971. The Simulation of Moving Sound Sources. *J. Audio Eng. Soc.* 19, 2-6, 1971. Reprinted in *Computer Music Journal* 1 (3) 1977. Reprinted in *La Musica Elettronica*, Feltrinelli, ed., Italy.
- Chowning, J. 1972. The Stanford Computer Music Project. Numus-West 1. Reprinted in *Journal of the Audio Engineering Society* 21 (7) Sept. 1973.
- Chowning, John. 1975. Computers, Composition, and Research. *Erste Woche für Elektronische Musik 10.-15. Februar 1975* (G. Bennett ed.), pp. 38-48. Musik-Akademie der Stadt Basel (Switzerland). 1975.
- Chowning, J. 1973. The Synthesis of Complex Audio Spectra by Means of Frequency Modulation. *J. Audio Eng. Soc.* 21 (7). Reprinted in *Computer Music Journal* 1 (2) 1977. Reprinted in *Musical Aspects of the Electronic Medium, Report on Electronic Music*, ed. F. Weiland. Utrecht: Institute of Sonology, 1975. Reprinted in Roads, C., and J. Strawn, Eds. *Foundations of Computer Music*, Cambridge: MIT Press, 1987.
- Chowning, J. and J. M. Grey. J. A. Moorer and L. Rush. 1974. Computer Simulation of Music Instrument Tones in Reverberant Environments, , Stanford University Report STAN-M-1.
- Chowning, J. 1980. Synthesis of the singing voice by frequency modulation. In E. Jansson and Johan Sundberg, *Sound generation in winds, strings, and computers*, Stockholm, Royal Academy of Music, pp. 4-13.
- Chowning, J. 1980. Synthesis of the Singing Voice by Means of Frequency Modulation. In *Sound Generation in Winds, Strings, Computers*. Royal Swedish Academy of Music No. 29. Reprinted in *Current Directions in Computer Music Research*, Edited by Max V. Mathews and John R. Pierce, MIT Press, 1989.
- Chowning, J. 1983. FM Synthesis: its evolution, Proceedings of International Computer Music Conference, Rochester, NY.
- Chowning, J. 1985. Tech Talk - John Chowning on technology and music. In *Electronics & Music Maker*, 5(1) Sept and 5(2) Oct 1985, Cambridge, England.
- Chowning, J., and D. Mercier. 1985. Interview with John Chowning , in *Les Cahiers de l'ACME*, Belgium.
- Chowning, J., and D. Bristow. 1986. *The Theory and Practice of FM Synthesis*, , Yamaha Foundation, Tokyo.
- Chowning, J. 1990. Music from Machines: Perceptual Fusion and Auditory Perspective - for Ligeti -, contributed paper for Festschrift for Gyorgi Ligeti, Hamburg, Germany, 1988. Also published as Stanford Department of Music Technical Report STAN-M-64, March 1990.
- Chowning, J. (1993). Computer music: a grand adventure and some thoughts about loudness. In *PROCEEDINGS OF THE INTERNATIONAL COMPUTER MUSIC*

CONFERENCE (pp. 2-2). INTERNATIONAL COMPUTER MUSIC  
ASSOCIATION.  
<http://hdl.handle.net/2027/spo.bbp2372.1993.001>

Chowning, J. 1999. "Perceptual Fusion and Auditory Perspective." In P. Cook (ed.),  
*Music, Cognition, and Computerized Sound: An Introduction to Psychoacoustics*,  
261-275. Cambridge, MA: MIT Press.

Chowning, J. M. (2000, December). Digital sound synthesis, acoustics and perception: A  
rich intersection. In *Proceedings of the COST G-6 Conference on Digital Audio  
Effects (DAFX-00)*, Verona, Italy.

Chowning, J. 2005. "Composer le son lui-même", John Chowning. Portraits polychromes.  
P.A. Castanet, É. Gayou, J.C. Risset et al. (eds.). Paris: Ina-GRM/CDMC, pp. 25-30.

Chowning, J. 2007. "Stria: Lines to Its Reconstruction." *Computer Music Journal* 31(3).

Chowning, J. (2008). *OUT OF SYNC: A SIMPLE SCORE BASED GUI FOR QUICK CORRECTION IN PERFORMER  
COMPUTER INTERACTION*. Ann Arbor, MI: MPublishing, University of Michigan Library, vol. 2008, August 2008 Issue  
title: Routes/Roots  
<http://hdl.handle.net/2027/spo.bbp2372.2008.126>

Chowning, J. (2008). Fifty Years of Computer Music: Ideas of the Past Speak to the  
Future. In *Computer Music Modeling and Retrieval. Sense of Sounds* (pp. 1-10).  
Springer Berlin Heidelberg.

Chowning, J. (2009). Wave studies: Sailing an ocean with Max and Marjorie Mathews.  
*Computer Music Journal*, 33(3), 35-40.

Chowning, J. (2011). Turenas: the realization of a dream. *Proc. of the 17es Journées  
d'Informatique Musicale, Saint-Etienne, France*.

From: <http://ccrma.stanford.edu/STANM/stanm/node1.html>

Chowning 1990

Chowning, J. M. 1990 (Mar.).  
*Music From Machines: Perceptual Fusion and Auditory Perspective - for Ligeti*.  
Tech. rept. [STAN-M-64](#). Stanford University Department of Music. (\$4.00).

Chowning and Mont-Reynaud 1986

Chowning, J. M., and B. Mont-Reynaud. 1986 (May).  
*Intelligent Analysis of Composite Acoustic Signals, Final Report*.  
Tech. rept. [STAN-M-36](#). Stanford University Department of Music. (\$4.00).

Chowning and Sheeline 1982

Chowning, J. M., and C. Sheeline. 1982 (Nov.).  
*Auditory Distance Perception Under Natural Sounding Conditions, Final Report*.  
Tech. rept. [STAN-M-12](#). Stanford University Department of Music. (\$5.00).

Chowning et al. 1974

Chowning, J. M., J. M. Grey, L. Rush, and J. A. Moorer. 1974.  
*Computer Simulation of Music Instrument Tones in Reverberant Environments*.  
Tech. rept. [STAN-M-1](#). Stanford University Department of Music.

Chowning et al. 1978

- Chowning, J. M., J. M. Grey, L. Rush, J. A. Moorer, and L. Smith. 1978 (May). *Simulation of Music Instrument Tones in Reverberant Environments, Final Report*. Tech. rept. [STAN-M-8](#). Stanford University Department of Music. (\$3.00).
- Chowning *et al.* 1982  
Chowning, J. M., J. M. Grey, J. A. Moorer, and L. Rush. 1982 (Aug.). *Instrumental Timbre and Related Acoustical Phenomena in the Perception of Music, Final Report*. Tech. rept. [STAN-M-11](#). Stanford University Department of Music. (\$4.00).
- Chowning *et al.* 1984  
Chowning, J. M., L. Rush, B. Mont-Reynaud, C. Chafe, A. Schloss, and J. Smith. 1984 (Jan.). *Intelligent Systems for the Analysis of Digitized Acoustic Signals, Final Report*. Tech. rept. [STAN-M-15](#). Stanford University Department of Music. (\$6.00).

### **Publications about:**

- Anderson, E. Ruth. Chowning, John M- biographical entry in *Contemporary American Composers*, A Biographical Dictionary, second edition.
- Baudouin, O. 2007. "A Reconstruction of *Stria*." *Computer Music Journal* 31(3).
- Baudouin, O, 2012. *Pionniers de la musique numérique*, Sampzon, Delatour France, 380 pages.
- Beltrami, Cesare (ed). 2013. "ARTE E FISICA DEL SUONO Relazioni tra scienza acustica e composizione elettroacustica." saggio introduttivo di John Chowning, Edizioni Franco Angeli, Milano.
- [Beltrami, Caesar (ed). 2013. "ART AND PHYSICS OF SOUND Relations between science acoustics and electroacoustic composition." Introductory essay by John Chowning, published by Franco Angeli, Milano.]
- Bossis, B. 2005. "Stria de John Chowning ou l'oxymoron musical: du nombre d'or comme poétique". *John Chowning. Portraits polychromes*. P.A. Castanet, É. Gayou, J.C. Risset et al. (eds). Paris: Ina – Michel de Maule, pp. 87-115.
- Boulez, P. 1980. *Pierre Boulez présente: Stria* (1977); extraits / John Chowning. Kontakte (1960); extraits / Karlheinz Stockhausen. Arcus (1978); extraits / York Höller. Audio cassette, IRCAM-Radio France Série II / Cassette 3 (Matériau et invention musicale, Vol. 3.). (Audio recording of concerts presented at IRCAM and the Ensemble InterContemporain, 22-28 April 1980, recorded at the Théâtre d'Orsay, Paris).
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- Dahan, K. 2007. "Surface Tensions: Dynamics of *Stria*." *Computer Music Journal* 31(3).

- Gayou, É. 2005. "Entretien entre John Chowning et Évelyne Gayou". *John Chowning. Portraits polychromes*. P.A. Castanet, É. Gayou, J.C. Risset et al. (eds.). Paris: Ina-GRM/CDMC, pp. 7-24.
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- Lehrman, Paul D. 2005. A Talk With John Chowning PART II—MAKING ELECTRONICS SING. *Mix Magazine*. March, 2005. [http://mixonline.com/mag/audio\\_talk\\_john\\_chowning\\_2/](http://mixonline.com/mag/audio_talk_john_chowning_2/)
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- Meneghini, M. 2007. "An Analysis of the Compositional Techniques in John Chowning's *Stria*." *Computer Music Journal* 31(3).
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- Pottier, Laurent, « Turenas, analyse », *John Chowning*, coll. Portraits Polychromes, Paris : INA-GRM, 2004, p. 67-85 (pp. 61-73 in the 2013 english translation of the book)
- Pottier, Laurent, « Turenas (1972) de John Chowning, vers une version interactive », *revue Musimediane* (Internet), n° 6, 2011, <http://www.musimediane.com/spip.php?article131>.
- Pottier, Laurent, « La "régénération" des sons de *Turenas* de John Chowning », *Musique et technologie, préserver, archiver, re-produire*, dir. Evelyne Gayou, Portraits polychromes, Hors série thématique, Paris, INA-GRM, 2013, p. 145-196.
- Risset, J.-C. 2005. "Sur l'impact de l'œuvre scientifique, technique et musicale de John Chowning". *John Chowning. Portraits polychromes*. P.A. Castanet, É. Gayou, J.C. Risset et al. (eds.). Paris: Ina-GRM/CDMC, pp. 31-59.

Roads, C. ed. (1985). "John Chowning on composition". *Composers and the computer*. Los Altos CA: William Kaufman, pp. 16-25. Also available on-line. <http://www.o-art.org/history/LongDur/Chowning.html> (accessed 28 February 2007).

Zattra, L. 2007. "The Assembling of *Stria* by John Chowning: A Philological Investigation." *Computer Music Journal* 31(3).

*"ARTE E FISICA DEL SUONO*

*Relazioni tra scienza acustica e composizione elettroacustica"*

a cura di Cesare Beltrami

saggio introduttivo di John Chowning

Edizioni Franco Angeli, Milano, 2013.

## Web

Jure, L. 2004, "Escuchando *Turenas* de John Chowning." *Músicas al Sur* - Número 1 - Enero 2004  
<http://www.eumus.edu.uy/revista/nro1/jure.html>

Pottier, L. 2010, "*Turenas*" (1972) de John Chowning, vers une version interactive. *Musimédiane*.  
<http://www.musimediane.com/numero6/POTTIER/index.html>

## Media

### Television

Chowning, J. 1981. "Artists in the Lab." Transcript of a PBS television program *Nova* #817, first broadcast November 15th, 1981. Boston MA.  
<http://www.pbs.org/wgbh/nova/listseason/08.html>

#### Artists in the Lab

Many were delighted by the extraordinary special effects in movies like "2001" and "Star Wars," but few realized how their magic relied on technologies as futuristic as their science fiction plots. *NOVA* introduces 20th century pioneers who use computers and lasers to create an extraordinary array of strange, exciting new art forms.

Original broadcast date: 11/15/81

Topic: photography/film

#### Jane Pauley NBC Archives

STANFORDS MUSIC DIR CHOWNING DISCUSSES  
COMPUTERIZED MUSIC

Media Id: T830214

1983/02/14

#### Computer Chronicles- KCSM TV San Mateo

*Computer Music*. program no. 1012, recorded 12/05/83

<http://www.archive.org/details/Computer1984>

Odysseys in Technology: Max Mathews & John Chowning - Music Meets the Computer



Computer History Museum — <http://www.computerhistory.org/contact/>  
Recorded: December 14, 2004]  
<http://www.youtube.com/watch?v=Hloic1oBfug>

## Radio

Publisher #: Cassettes IRCAM-Radio France Série II/Cassette 3  
Author: Chowning, John M.  
Title: [Stria. Selections]  
Title: Pierre Boulez présente : Stria (1977); extraits / John Chowning. Kontakte (1960); extraits / Karlheinz Stockhausen. Arcus (1978); extraits / York Höller.  
Imprint: Paris : [1981].  
Physical Description: 1 sound cassette.  
Series: (Matériau et invention musicale, Vol. 3.)  
Note: No. 3 of 3 programs presented by IRCAM and the Ensemble InterContemporain April 22-28, 1980, recorded at the Théâtre d'Orsay, Paris.  
Note: Each selection introduced and analyzed by Pierre Boulez.  
Added author: Stockhausen, Karlheinz, 1928- Kontakte. Selections.  
Added author: Höller, York. Arcus. Selections.  
Added author: Aimard, Pierre-Laurent, 1957-  
Added author: Cerutti, Michel.  
Added author: Eötvös, Peter.  
Organization: Ensemble intercontemporain.  
Organization: IRCAM (Research institute : France)

SU access

Catkey: 343133

Call Number, Location, and Availability

Stanford Auxiliary Library - SAL3

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## Quotes

### Media

Science News, vol. 135, no. 13, p. 202, 1989. "The ultimate applications (of the Biomuse) probably are not obvious."