

Sound Studies and Sonic Arts

Winter Term 2026/27

Phase Focus

Module Theory, Practice

Course Title **One and Many: Sonic Multiplicity, Identity, and Collective Behavior** | Workshop

Course Times and Location January 18 – 22, 2027 | 10 a.m. – 4 p.m. | LIE 316

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Office Hours Upon request after class

Possible Credit Points Theory 2CP (NG), 4CP (G), Practice 2CP (NG), 4CP (G), Free Focus 2CP/4CP (NG)

Course Description

What changes when a sonic process becomes a population? A sound can be doubled, multiplied, slightly differentiated, distributed in space, divided into groups, or made responsive to other sounds. Many sources may fuse into a single auditory stream, while small differences of pitch, timing, rhythm, timbre, modulation, or position can make individual voices emerge. The workshop takes the unstable distinction between one and many as a starting point for thinking about sonic identity, multiplicity, and collective behavior.

The week moves from auditory grouping and voice identity to copying and difference, shared and individual variation, interlocking and distributed structure, heterophony and polyphony, density and sonic mass, clouds and distributions, spatial grouping, populations, simple networks, and swarm behavior. These are treated as practical and conceptual models for constructing sound rather than as a fixed taxonomy. Historical works, sound art, electronic and electroacoustic practices, environmental recordings, and selected ensemble models serve as examples of ways in which sonic identities can arise, persist, merge, split, and reorganize.

The workshop is hybrid theory and practice. Short readings from sound and music theory, philosophy, anthropology, sound studies, and studies of collective performance are discussed alongside guided listening and hands on experiments with prepared digital examples. No prior experience in coding or digital signal processing is expected. Practical work starts by multiplying a single process and then introduces population controls such as number, centre, spread, density, correlation, grouping, and spatial distribution. From there we work with shared control, individual deviation, group level organization, local interaction, and network topology. The emphasis is on constructing and listening: how can one system move between fusion and separation, individual voices and fields, polyphony and mass, or independent and mutually dependent behavior?

Requirements for attending

No prior technical knowledge is required. Please bring a laptop and headphones. Prepared software examples will be introduced in class. An audio interface is useful but not required. All assigned readings will be short articles or selected excerpts.

MA-candidates cannot do 4CP assignments in this course.

max. 15 students

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Exam / Credit Points

2 Credit Points (not graded: Theory, Practice, Free Focus): Regular attendance, active participation, and presentation of a short individual or small group study in class.

Consecutive assignment leading to 4CP for the course (optional, graded: Theory, only the consecutive assignment is graded; not graded: Free Focus): a theory term paper of 5,000 to 8,000 words.

OR

Consecutive assignment leading to a total of 4CP for the course (optional, graded: Practice, only the consecutive assignment is graded; not graded: Free Focus): an installation, fixed media work, performance, or comparable artistic study plus documentation of the development and a statement or reflection of no more than 5 pages.

Due date for all 4CP assignments in this course: 31.03.2027. MA-candidates, who need to register for their master's phase in early Feb. 2027 cannot do 4CP assignments in this course.

Schedule

Day 1: How Many Sounds? Identity, Fusion, and Auditory Grouping

We begin with the perceptual problem of one and many. What makes several sources fuse into one auditory object, and what makes one field split into identifiable voices? We compare physical sources, computational channels, and perceived auditory identities. Listening examples include Thomas Tallis and Janet Cardiff, choral unison, phasing, layering, and environmental recordings of collective animal sound.

Practice: one process is duplicated into 2, 4, 8, 16, and more instances. We introduce pitch spread, timing spread, timbral difference, independent modulation, and spatial spread one at a time, listening for changes between fusion, beating, chorus, separate voices, and field. Population controls are introduced as a way to move between shared identity and individuation.

Reading: Erin Manning. 2010. "Always More than One: The Collectivity of a Life." *Body & Society* 16 (1): 117 to 127. Selected pages.

Reading: James Tenney. Meta + Hodos. Selected excerpt on Gestalt factors of cohesion and segregation.

Day 2: Copying, Difference, and Distributed Structure

What kinds of many can be produced from one process? We develop a practical vocabulary by starting with duplication and then introducing difference and relation. Copying, temporal offset, distribution, layering, shared material, individual deviation, grouping, forking, and merging provide operations from which terms such as unison, chorus, canon, hocket, interlocking, heterophony, and polyphony can be heard and tested. The emphasis is on extracting organizational ideas that can be used in sound synthesis and artistic practice. A central theoretical question is whether the individual voice is given in advance or can emerge through relations within a population.

Practice: begin with one sound process and make several versions of it. Compare exact copies with temporal displacement, shared control with individual deviation, and a complete pattern with the same material distributed across several agents. Work with common pitch or contour, independent timing, timbral difference, and subgroup control. Build simple processes that split one identity into several trajectories and later bring them together again.

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Listening examples introduce canon, hocket, interlocking, heterophony, and polyphony only insofar as they offer useful models for constructing sonic relations.

Reading: Jean Luc Nancy. 2000. Being Singular Plural. Selected opening excerpt on singularity, plurality, and being with.

Reading: Trevor Wishart. 1996. On Sonic Art. Selected excerpt from Chapter 6, "Gesture and Counterpoint."

Day 3: From Lines to Masses: Density, Clouds, and Polyphonic Assemblages

What happens when there are too many lines to follow? We examine the transition from trackable voices to mass, texture, and cloud. Xenakis and Ligeti provide two contrasting approaches to dense multiplicity, while Phill Niblock and selected electronic works show how small differences can produce beating, spectral fields, and emergent higher level objects. Anna Tsing's idea of the polyphonic assemblage opens the question beyond music toward multiple temporalities and forms of coordination.

Practice: control populations by number, centre, spread, density, duration, distribution, correlation, and clustering. Build sparse fields, dense fields, pitch clouds, rhythmic clouds, clusters, and groups. Listen for the point at which individual detail gives way to statistical or textural description, and for ways of moving back from mass toward identifiable voices.

Reading: Iannis Xenakis. 1955. "The Crisis of Serial Music." Short text.

Reading: Anna Lowenhaupt Tsing. 2015. "Arts of Noticing." Selected pages on polyphonic assemblage, from *The Mushroom at the End of the World*.

Day 4: Collective Behaviour: Groups, Networks, and Swarms

Simultaneity is not yet interaction. We distinguish independent populations, shared control, group organization, coupling, and networked relations. A network is introduced simply as a population together with a rule for who can affect whom. We compare all to all, ring, star, clustered, and local neighborhood structures, and ask how topology becomes audible. Christian Wolff's Exercises provide a concrete model of ensemble interaction in which performers can work responsively, independently, and emergently, while Pauline Oliveros and The Hub offer other ways of organizing distributed attention and agency.

Practice: begin with the same set of sonic agents and change only their pattern of relations. Compare global and local control, leader and follower structures, subgroups, attraction and repulsion, simple graph based coupling, and cellular neighborhoods. Test responsive, independent, and emergent forms of interaction in sound processes, and compare situations in which relationships are fixed with those in which collective behavior develops unpredictably. The focus is on how individual behavior changes when agents become mutually dependent. Detailed theories of entrainment and synchronization are left for a separate context.

Reading: Emily Payne and Philip Thomas. 2022. "Ensemble Interaction in Indeterminate Music: A Case Study of Christian Wolff's Exercises." In *Together in Music: Coordination, Expression, Participation*, pp. 148 to 154.

In class source: selected instructions and scores by Christian Wolff and Pauline Oliveros, discussed as practical models of distributed agency, response, and collective listening.

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Day 5: Open Studies: One and Many

Participants develop and present short individual or small group studies using the ideas of the week. The format is open. A study might move from one sound to many, from unison to beating and cloud, from shared to individual control, from independent agents to clusters, from a centered source to a spatial field, from polyphony to mass, or from a population to a simple network. Work may use synthesis, samples, field recordings, live sound, spatial distribution, or combinations of these.

The final discussion returns to the theoretical questions of the workshop. What makes a sonic individual? When is it more useful to describe sound in terms of voices, groups, distributions, clouds, masses, or networks? How can a system move between these forms of multiplicity? What changes when control shifts from individual parameters to population level parameters or relational rules? When do terms such as voice, swarm, assemblage, or multitude clarify what we hear, and when do they obscure it?

Supporting Media

Bregman, Albert S. 1990. *Auditory Scene Analysis: The Perceptual Organization of Sound*. Cambridge, MA: MIT Press.

Assigned: selected excerpt on auditory grouping and stream segregation.

Manning, Erin. 2010. "Always More than One: The Collectivity of a Life." *Body & Society* 16 (1): 117–127.

Assigned: selected pages.

Tenney, James. 1988. *Meta + Hodos: A Phenomenology of 20th-Century Musical Materials and an Approach to the Study of Form and META Meta + Hodos*. 2nd ed. Frog Peak Music.

Assigned: selected excerpt from "Gestalt-Factors of Cohesion and Segregation."

Nancy, Jean-Luc. 2000. *Being Singular Plural*. Translated by Robert D. Richardson and Anne E. O'Byrne. Stanford, CA: Stanford University Press.

Assigned: selected opening excerpt from "Of Being Singular Plural," focusing on singularity, plurality, and being-with.

Wishart, Trevor. 1996. *On Sonic Art. New and revised edition*. Edited by Simon Emmerson. Amsterdam: Harwood Academic Publishers.

Assigned: selected excerpt from chapter 6, "Gesture and Counterpoint."

Xenakis, Iannis. 1955. "La crise de la musique sérielle" [The Crisis of Serial Music]. *Gravesaner Blätter* 1: 2–4.

Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton, NJ: Princeton University Press.

Assigned: selected pages from chapter 1, "Arts of Noticing," especially pp. 23–24 on the polyphonic assemblage.

Payne, Emily, and Philip Thomas. 2022. "Ensemble Interaction in Indeterminate Music: A Case Study of Christian Wolff's Exercises." In *Together in Music: Coordination, Expression, Participation*, edited by Renee Timmers, Freya Bailes, and Helena Daffern, 148–154. Oxford: Oxford University Press.