

NONLOCAL VARIATIONAL PROBLEMS AND PDEs

Program

June 13-17, 2016

The University of British Columbia Earth Sciences Building (ESB) 2207 Main Mall, Vancouver

ORGANIZERS: Rustum Choksi (McGill), Michael Ward (UBC), Juncheng Wei (UBC)

Getting Started

Get connected: Select the "ubcvisitor" wireless network on your wireless device. Open up a web browser, and you will be directed to the login page.

FAQs

Q: Where do I check in on the first day?

Check- in and package pick up can be done in the Atrium.

Q: Where are the sessions?

- All plenary sessions will be in the Earth Sciences Building Room 2012.
- You will find a copy of the building floor on page 3 and a campus map at the end of the program.

Q: Will the program change?

Program changes and updates will be announced at each session.

Q: When should I wear my badge?

Please wear your name badges at all times on site so that PIMS Staff recognize you as a guest.

Q: Where can I go for help on site?

If you need assistance or have a question during the conference, please feel free to talk to one of the organizers.

Q: Where can I get refreshments and meals?

For snacks or quick meals, please view the list of UBC eateries attached at the end of the program. Coffee breaks are provided each day of the workshop and a hosted lunch provided on Monday and Thursday noon.

Q: Where can I get directions for campus and the building?

You will find a copy of the building floor on page 3 and a campus map at the end of the program.

Q: Where can I get a cab to pick me up from the Venue?

You can call Yellow Cab (604-681-1111) and request to be picked up at the intersection of West Mall and Bio. Sciences Road. Use the south entrance and walk straight down to the intersection.

There will be photography throughout this event. PIMS' event photography is used across a variety of our communications platforms including web, print and electronic promotional materials. If, for any reason, you wish not to have your photo taken or used in this manner, please contact the event organizers.

Conference Room Guide:

All Sessions: ESB 2012



** Not drawn to scale. See detailed UBC map on the last page

General Travel Directions:

UBC Map link: http://www.maps.ubc.ca/PROD/images/pdf/ubcmap.pdf

Airport to UBC: Easiest by taxi (25min, around \$30). If your accommodation is at Walter H Gage Towers, please give them the address: 5959 Student Union Boulevard, UBC. By public transport, take the Canada Line (rail) to Broadway-City Hall station. From Broadway-City Hall station, cross Broadway and Cambie streets to get to the #99 UBC bus stop in front of London Drugs. Tickets (valid for the whole journey to UBC) can be purchased from the machine in the airport station. Cost: approximately \$6. Journey time: Circa more than 1 hour

UBC Bus Loop/ Gage to Earth Science Building (ESB) 2207 Main Mall: A quick 10min walk. See UBC map. Head west past the student union building, cross East Mall and get onto Main Mall. Turn left (South) on Main Mall and Earth Science Building will be on your right after a few minutes. It is a large new building, and is on Main Mall directly across from the Beatty Biodiversity Centre and prominent blue whale skeleton.

Public Transit: Feel free to search and plan your public transport rides by visiting <u>http://www.translink.ca/</u>, where directions, ticket costs and bus schedules are indicated.

Parking at UBC: http://www.parking.ubc.ca/visitor.html

Monday June 13, 2016

8:50am - 9:00am	Opening remarks and announcements.	
9:00am - 10:00am	<u>Mini-course 1</u> : Enrico Valdinoci, Weiertrass Institute:	
	Nonlocal equations from various perspectives	
10:00am - 11:00am	<u>Mini-course 2*</u> : Theodore Kolokolnikov, Dalhousie University	
	Nonlocal systems arising from local PDE's and related problems.*Unfortunately Martin Burger, who was scheduled to deliver a mini-course, is unable to attend. We are very grateful to Theodore Kolokolnikov for agreeing to replace Martin on such short notice and to give a mini course on Nonlocal systems arising from local PDE's and related problems.	
11:00am - 11:20am	Coffee break (20 minutes)	
11:20am - 12:10pm	Qiang Du, Columbia University:	
	Localization of nonlocal continuum models	
12:10pm - 2:00pm	Hosted Lunch: Magma Café, see map on page 2;	
	Please show/have your name tag at this break	
2:00pm - 2:50pm	Ovidiu Savin, Columbia University:	
	Obstacle type problems for minimal surfaces	
2:50pm - 3:40pm	Cyrill Muratov, New Jersey Institute of Technology:	
	Low density phases in geometric and phase field models of uniformly charged liquids	
3:40pm - 4:10pm	Coffee Break (30 minutes)	
4:10pm - 5:00pm	Monica Musso, Pontifical Catholic University of Chile:	
	A non-compactness result on the fractional Yamabe problem in large dimensions	

Tuesday June 14, 2016

9:00am - 10:00am	<u>Mini-course 1</u> : Enrico Valdinoci, Weiertrass Institute:
	Nonlocal equations from various perspectives
10:00am - 11:00am	<u>Mini-course 2</u> : Theodore Kolokolnikov, Dalhousie University
	Nonlocal systems arising from local PDE's and related problems.
11:00am - 11:20am	Coffee break (20 minutes)
11:20am - 12:10pm	Yannick Sire, Aix-Marseille University:
	On the singular fractional Yamabe problem

12:10pm - 12:20pm	Group photo outside meeting room/ near registration table
12:20pm — 2:00pm	Lunch (See list of campus eateries beginning on page 14)
2-00pm - 2:50pm	Xin Yang Lu, McGill University:
	Average distance problem: new models and regularity of minimizers
2:50pm - 3:20pm	Coffee Break (30 minutes)
3:20pm - 4:10pm	Xavier Ros-Oton, University of Texas at Austin:
	Free boundary regularity in the parabolic fractional obstacle problem
5:30pm	Meet at the Alumni Centre and depart for group dinner.
	Kirin Restaurant; 555 W 12th Ave
	(please ensure that you have signed / paid for the dinner by Mon. June 13 at 2:10pm)

Wednesday June 15, 2016

9:00am - 10:00am	<u>Mini-course 1</u> : Enrico Valdinoci, Weiertrass Institute:
	Nonlocal equations from various perspectives
10:00am - 11:00am	<u>Mini-course 2</u> : Theodore Kolokolnikov, Dalhousie University
	Nonlocal systems arising from local PDE's and related problems.
11:00am - 11:20am	Coffee break (20 minutes)
11:20am - 12:10pm	Ihsan Topaloglu, McMaster University:
	Nonlocal energies defined via attractive-repulsive interaction potentials
12:10pm - 1:00pm	Katy Craig, UCLA:
	From slow diffusion to a hard height constraint: characterizing congested aggregation

Thursday June 16, 2016

9:00am - 9:50am	Anthony Pierce, University of British Columbia:	
	Modeling multi-scale processes in hydraulic fracture propagation	
9:50am - 10:40am	Antoinne Mellet, University of Maryland:	
	A higher order free boundary problem for hydraulic fractures	
10:40am - 11:10am	Coffee break (30 minutes)	

11:10am - 12:00pm	David Bourne, Durham University:
	Particle systems with Wasserstein Interaction: Analytical and Numerical Results
12:00pm - 12:50pm	Razvan Fetecau, Simon Fraser University:
	First-order aggregation models and zero inertia limits
12:50pm - 3:00pm	Hosted Lunch: Magma Café, see map on page 2;
	Please show/have your name tag at this break
3:00pm - 3:50pm	Xiaofeng Ren, George Washington University:
	Bubbles and droplets in a singular limit of the FitzHugh-Nagumo system
3:50 pm - 4:20pm	Coffee break (30 minutes)
4:20pm - 5:10pm	Eliot Fried, Okinawa Institute of Science and Technology:
	Solution of the Kirchhoff—Plateau problem

Friday June 17, 2016

9:00 am — 9:50 am	Weiwei Ao, University of British Columbia:	
	Existence of positive solutions with a prescribed singular set of fractional Yamabe Problem	
9:50 am — 10:40 am	Laurent Betermin, University of Heidelberg:	
	Asymptotic expansion of logarithmic energy on the unit sphere	
10:40 am — 11:10 am	Coffee break (30 minutes)	
11:10am — 12:00 pm	Riccardo Cristoferi, Carnegie Mellon University:	
	An isoperimetric problem with nonlocal repulsive interaction	
12:00pm — 12:15 pm	Closing remarks from the organizers and Conference Evaluation Survey:	
	Participants of this event are required to fill in the online event evaluation survey available online at	

Titles and Abstracts: Mini-courses

Theodore Kolokolnikov, Dalhousie University

Nonlocal systems arising from local PDE's and related problems.

Many important PDE models have solutions that consist of localized structures that interact in a nonlocal way. A prominent example is the Gross-Pitaevskii equation used to model Bose-Einstein condensates and whose solutions consist of vortex-like structures. A wide class of reaction diffusion systems, such as Grey-Scott or Schnakenberg models, also admit solutions consisting of interacting spikes. In an appropriate limit, the interaction of these localized structures naturally leads to a nonlocal problem. In this mini-course we present some of the novel nonlocal models that arise in this way, and show how their analysis gives new insights into the original PDE models.

Enrico Valdinoci, Weiertrass Institute

Nonlocal equations from various perspectives

We would like to give a detailed presentation of some equations which exhibit some nonlocal phenomena. Often, the nonlocal effect is modeled by a diffusive operator which is (in some sense) elliptic and fractional. Natural examples arise from probability, geometry, quantum physics, phase transition theory and crystal dislocation dynamics. We will try to discuss some of the mathematical to ols that are useful to deal with these problems, explain in detail some of the main motivations, describe some recent results on these topics and list some open problems.

Titles and Abstracts: Regular Talks

Weiwei Ao, University of British Columbia

Existence of positive solutions with a prescribed singular set of fractional Yamabe Problem

We consider the problem of the existence of positive solutions with prescribed isolated singularities of the fractional Yamabe problem. Near each singular point, these solutions are approximated by the Delaunay-type singular solution which has been studied recently by De la Torre, Del Pino, Mar Gonzalez and J.C. Wei. Away from the singular points, these solutions are approximated by the summation of the Green's function. This result is the analogous result for the classical Yamabe problem studied by Mazzeo and Pacard (1999). This is a joint work with De la Torre, Mar Gonzalez and J.C. Wei.

Laurent Betermin, University of Heidelberg

Asymptotic expansion of logarithmic energy on the unit sphere

To understand the asymptotic expansion of minimal logarithmic energy on the unit sphere is currently a great challenge (Smale 7th problem). In this talk, we will explain how a Gamma-Convergence method of Sandier-Serfaty connected with recent results in Logarithmic Potential Theory about equilibrium measures with unbounded support allows us to prove the existence of the famous next-order term. Moreover, we will show that the conjecture of Brauchart-Hardin-Saff about the value of this coefficient and the conjecture about the global minimality of the triangular lattice for a Coulombian "renormalized energy" defined by Sandier and Serfaty are equivalent. This is a joint work with E. Sandier.

David Bourne, Durham University

Particle Systems with Wasserstein Interaction: Analytical and Numerical Results

In this talk I will discuss a class of nonlocal particle systems that arise in economics (optimal location problems and urban planning), electrical engineering (quantization and image processing), and materials science (crystallization and pattern formation). These energies can be formulated either in terms of atomic measures and Wasserstein distances or in terms of generalised Voronoi diagrams. For a specific example of such an energy, namely an idealised model of block copolymers, I will present a rigorous crystallization result about the optimality of the triangular lattice. For the broader class of energies I will present a numerical method, which is a generalisation of Lloyd's algorithm for computing centroidal Voronoi tessellations. This is joint work with Mark Peletier, Steven Roper, and Florian Theil.

Katy Craig, UCLA

From slow diffusion to a hard height constraint: characterizing congested aggregation

For a range of physical and biological processes—from dynamics of granular media to biological swarming—the evolution of a large number of interacting agents is modeled according to the competing effects of pairwise attraction and (possibly degenerate) diffusion. In the slow diffusion limit, the degenerate diffusion formally becomes a hard height constraint on the density of the population, as arises in models of pedestrian crown motion.

Motivated by these applications, we bring together new results on the Wasserstein gradient flow of nonconvex energies with the theory of free boundaries to study a model of Coulomb interaction with a hard height constraint. Our analysis demonstrates the utility of Wasserstein gradient flow as a tool to construct and approximate solutions, alongside the strength of viscosity solution theory in examining their precise dynamics. By combining these two perspectives, we are able to prove quantitative estimates on convergence to equilibrium, which relates to recent work on asymptotic behavior of the Keller-Segel equation. This is joint work with Inwon Kim and Yao Yao.

Riccardo Cristoferi, Carnegie Mellon University:

An isoperimetric problem with nonlocal repulsive interaction

We consider an energy introduced by Choksi and Peletier as the Gamma-limit of the Ohta-Kawasaki energy for diblock copolymer, when one phase is predominant with respect to the other. The peculiarity of the minimization problem is the competition between a local term, the perimeter, and a nonlocal one, given by a Riesz potential. The former favors phase separation along sharp interfaces, while the latter drives the system towards scattered configurations. This makes the minimization non trivial. We study properties of local and global minimizers in several regimes. This is a joint work with Marco Bonacini.

Qiang Du, Columbia University:

Localization of nonlocal continuum models

Recent development of nonlocal vector calculus and nonlocal calculus of variations provides a systematic mathematical framework for the analysis of nonlocal continuum models in the form of partial-integral equations. In this lecture, we consider the localization of some nonlocal models and associated nonlocal function spaces in order to study connections with traditional local models given by partial differential equations and Sobolev spaces. In particular, we present some recent results on heterogeneous localization, including an extension of classical trace theorems to nonlocal spaces of functions with significantly weaker regularity. We also discuss their implications in nonlocal modeling and simulations of various anomalous processes.

Razvan Fetecau, Simon Fraser University

First-order aggregation models and zero inertia limits

We consider a first-order aggregation model in both discrete and continuum formulations and show how it can be obtained as zero inertia limits of second-order models. The limiting procedure becomes particularly important when one considers anisotropy in the first-order discrete model, as in that case the model becomes {\em implicit}, and issues such as non-uniqueness and jump discontinuities are being brought up. To extend solutions beyond breakdown we propose a relaxation system containing a small parameter \$\epsilon\$, which can be interpreted as a small amount of inertia or response time. We show that the limit \$\epsilon \to 0\$ can be used as a jump criterion to select the physically correct velocities. In the continuum setting, the procedure consists in a macroscopic limit, enabling the passage from a kinetic model for aggregation to an evolution equation for the macroscopic density. This is joint work with Joep Evers, Lenya Ryzhik and Weiran Sun.

Eliot Fried, Okinawa Institute of Science and Technology Solution of the Kirchhoff–Plateau problem

The Kirchhoff–Plateau problem concerns the equilibrium shapes of a system in which a flexible filament in the form of a closed loop is spanned by a soap film, with the filament being modeled as a Kirchhoff rod and the action of the spanning surface being solely due to surface tension. We establish the existence of an equilibrium shape that minimizes the total potential energy of the system under the physical constraint of non-interpenetration of matter, but allowing for self-contact of the filament. In our treatment, the bounding filament retains a finite thickness and a nonvanishing volume, while the soap film is represented by a set with finite two-dimensional Hausdorff measure. Moreover, the region where the soap film touches the surface of the filament is not prescribed a priori. This is joint work with Giulio Giusteri and Luca Lussardi.

Xin Yang Lu, McGill University

Average distance problem: new models and regularity of minimizers

The average distance problem, \$\min_X \int \text{dist}(x,X)dx \$\$, has been widely used in mathematical modeling of optimization problems, such as urban planning, fare structure optimization, and data analysis. Regularity of minimizers is a delicate problem: it is known that Lipschitz regularity holds, while \$C^1\$ is false in general. For many application, the original version of the average distance problem exhibits several drawbacks, thus additional penalization terms (e.g. Willmore energy, \$L^2\$ norm on the density, perimeter-to-area ratio, etc.) should be considered. In this talk we will present some recently introduced models, with results on the regularity of minimizers.

Antoinne Mellet, University of Maryland

A higher order free boundary problem for hydraulic fractures

We will discuss the properties of a free boundary problem which has been proposed to model the propagation of hydraulic fractures. The problem involves a third order non-local parabolic equation which can be seen as an interpolation between the porous media equation and the thin film equation. We will discuss the well-posedness of the problem and prove the existence of self-similar solutions.

Monica Musso, Pontifical Catholic University of Chile

A non-compactness result on the fractional Yamabe problem in large dimensions

Let \$(X^{n+1}, g^+)\$ be an \$(n+1)\$-dimensional asymptotically hyperbolic manifold with a conformal infinity \$(M^n, [h])\$. The fractional Yamabe problem addresses to solve

 $\left[P^{\sigma}, u = cu^{n+2} \right] (u) = cu^{n+2} u^{n+2} u^{n$

where $c \in \mathbb{R}\$ and $P^{\ (gamma)[g^+,h]}\$ is the fractional conformal Laplacian whose principal symbol is (-

 $Delta^{\infty}. In this paper, we construct a metric on the half space $X = \mathbb{R}^{n+1}_+$, which is conformally equivalent to the unit ball, for which the solution set of the fractional Yamabe equation is non-compact$

provided that \$n \ge 24\$ for \$\gamma \in (0, \gamma^*)\$ and \$n \ge 25\$ for \$\gamma \in [\gamma^*,1)\$ where \$\gamma^* \in (0, 1)\$ is a certain transition exponent. The value of \$\gamma^*\$ turns out to be approximately 0.940197. This is a joint work with Seunghyeok Kim and Juncheng Wei.

Cyrill Muratov, New Jersey Institute of Technology

Low density phases in geometric and phase field models of uniformly charged liquids

This talk is concerned with the macroscopic behavior of global energy minimizers in the three-dimensional Ohta-Kawasaki model of diblock copolymer melts. The model represents a paradigm for energy-driven pattern forming systems in which spatial order arises as a result of the competition of short-range attractive and long-range repulsive forces. We are interested in the large volume behavior of minimizers in the low volume fraction regime, in which one expects the formation of a periodic lattice of small droplets of the minority phase in a sea of the majority phase. Under periodic boundary conditions, we prove that the considered energy Γ -converges to an energy functional of the limit "homogenized" measure associated with the minority phase consisting of a local linear term and a non-local quadratic term mediated by a screened Coulomb kernel and exhibiting a transition from trivial to non-trivial minimizers. Asymptotically, the mass of the minority phase in a non-trivial minimizer spreads evenly across the domain. For the minimizers of the associated geometric variational problem, we also prove that the energy density distributes uniformly across the domain as well, and that minimizers appear as a uniformly distributed array of droplets, most of which minimize the energy density for the volume constrained whole space problem. This is joint work with H. Knuepfer and M. Novaga.

Anthony Pierce, University of British Columbia

Modeling multi-scale processes in hydraulic fracture propagation

Hydraulic fractures (HF) are tensile cracks that propagate in pre-stressed solid media due, to the injection of a viscous fluid. Hydraulic fracturing has become the focus of considerable public attention as new technology to develop multiple hydraulic fractures from deep horizontal wells has enabled the extraction of hydrocarbons from impermeable shale deposits. In this talk I provide examples of natural HF and situations in which HF are used in industrial problems. Natural examples of HF include the formation of dykes by the intrusion of pressurized magma from deep chambers. They are also used in a multiplicity of engineering applications, including: the deliberate formation of fracture surfaces in granite quarries; waste disposal; remediation of contaminated soils; cave inducement in mining; and, as mentioned above, the fracturing of hydrocarbon bearing rocks in order to enhance productivity of oil and gas wells. Novel and emerging applications of this technology include CO2 sequestration and the enhancement of fracture networks to capture geothermal energy.

I will show how dimensional reasoning can be used to identify the fundamental power-law relationships between the variables depending on the balance between the dominant physical processes that are active. I will describe the governing equations in 1-2D (1

dimensional fluid flow and 2 dimensional elasticity) as well as 2-3D models of HF, which involve a coupled system of degenerate nonlinear integro-partial differential equations as well as a free boundary. We demonstrate that a re-scaling of these models and dominant balance arguments can be used to identify special asymptotic solutions that are of crucial importance in the location of the fracture free boundary. I will discuss recent results in which a novel approximate solution of the connection problem involving a steadily moving semi-infinite HF can be used to derive efficient algorithms to model the multi-scale processes involved in the propagation of an arbitrarily shaped planar HF. I discuss the challenges for efficient and robust numerical modeling of the 2-3D HF problem and some techniques recently developed to resolve these problems. The efficacy of these techniques is demonstrated by comparing numerical results to analytic solutions for simple geometries and with laboratory experiments.

Xiaofeng Ren, George Washington University

Bubbles and droplets in a singular limit of the FitzHugh-Nagumo system

The FitzHugh-Nagumo system is a classical activator-inhibitor type reaction-diffusion system, originally proposed to model excitable neurons. In one parameter range, the system is reduced, via the Gamma convergence theory, to a inhibitory geometric problem. We first study this geometric problem on the entire plane for disc solutions, called bubbles. In two space dimensions, depending on the two parameters of the problem, one may have zero, one, two, or even three bubbles. Some of these bubbles are stable while others are unstable. In dimenions three and higher the three bubble phenomenon does not occur. Next we build assemblies of perturbed small discs, termed droplets, as stable stationary points of the geometric problem on a bounded domain. This is joint work with Chao-Nien Chen, Yung-Sze Choi, and Yeyao Hu.

Xavier Ros-Oton, University of Texas at Austin

Free boundary regularity in the parabolic fractional obstacle problem

We study the regularity of the free boundary in the parabolic obstacle problem for the fractional Laplacian. This problem arises in American option models when the assets prices are driven by pure jump L'evy processes.

Our main result establishes that, when $s>\frac12$, the free boundary is a $C^{1,\alpha}$ graph in x and t near any regular free boundary point $(x_0,t_0)\in \rhoartial(u>\varphi)$. Furthermore, we also prove that solutions u^s are C^{1+s} in x^s and t^s near regular points, with a precise expansion at all such points.

Ovidiu Savin, Columbia University

Obstacle type problems for minimal surfaces

We describe certain obstacle type problems involving a standard and a nonlocal minimal surface. We discuss optimal regularity of the solution and a characterization of the free boundary. This is joint work with L. Caffarelli and D. De Silva.

Yannick Sire, Aix-Marseille University

On the singular fractional Yamabe problem

After introducing the regular fractional Yamabe problem, I will go on developing results on a singular version of it. I will concentrate on recent results on conformally flat metrics dealing with solutions of the critical equation exhibiting isolated singularities or more generally being singular along a set of zero capacity.

Ihsan Topaloglu, McMaster University

Nonlocal energies defined via attractive-repulsive interaction potentials

A variety of physical and biological interaction -- from self-assembly of nano particles to collective behavior of many-agent systems such as biological swarming -- can be modeled via a nonlocal energy. Depending on the choice of the interaction kernel, the asymptotic states of these physical and biological systems can be characterized as minimizers of such energies via a gradient flow connection. In this talk, first, I will present on how regularization of singular attractive-repulsive kernels allows us to restore convexity and differentiability; hence enables us to understand the minimizers and the gradient flows of these energies (joint work with K. Craig). Next, I will consider the minimization of these energies over sets. I will discuss the additional challenges this nonlocal shape optimization problem poses and establish the existence/nonexistence of minimizers on certain parameter regimes. This is a joint work with A. Burchard and R. Choksi.



Student Union Building (1)

Subway Mon - Fri 7:30am-2pm

Starbucks Mon - Fri 7:30am-6pm, Sat 8:30am-3pm

University Village (2)

University Village has many take out and dine in options; diner-style breakfasts, coffee shops, pizza by the slice, bubble tea, a full-service sushi restaurant, a small grocer selling fresh produce and assorted goods, as well as an international food court

Blenz Coffee McDonalds Only U Café Subway Suga Sushi Japanese Booster Juice Pearl Fever Tea House Starbucks Red Burrito Oven Fresh Bakery Mio Japan FreshSlice Pizza Pita Pit Well Tea A&W Granville Island Produce One More Sushi Vera's Burger Shack 5 Tastes Chinese Bistro International Food Court

Wesbrook Village (3)

Wesbrook Village, located on south campus, offers shops, services and homes within a quaint, pedestrianfriendly setting, with access to Pacific Spirit Park and all the amenities of the UBC campus.

Save-On-Foods

Large grocery store with a deli and small café

Chef Hung Taiwanese Beef Noodle Noodles, soups, rice dishes, and sides Jugo Juice

Fresh fruit smoothies BierCraft Craft pub with a French-inspired Bistro menu.

UBC Campus Food Trucks

Menchie's Frozen Yogurt

Frozen yogurt and sorbet bar

Togo Sushi

Fresh sushi made to order **Blenz**

Coffee shop

m ubc ca

Doughgirls Comfort Kitchen + Bakeshop Fresh made bread and pastries.

Hungry Nomad The original UBC food truck! Roaming Bowl Fresh made Asian noodle and rice bowls

The Dog House

The home of the West Coast hot dog

The Nest

The Nest, located on the new University Square beside the Student Union Building, will offer AMS owned and operated restaurants and shops for the summer of 2015!

Perch Uppercase Pier² Pizza Flip Side Qoola Frozen Yogurt Bar Peko Sushi Palate The Pit Grand Noodle Emporium The Delly



On-Campus Dining

at the University of British Columbia



Full-Service Restaurants

Mahoney & Sons Public House (14)

Irish-style pub serving salads, appetizers, pizzas, and a sampling of classic pub fare

Triple O's (15)

Dine in or take out - breakfast sandwiches, beef, chicken, and veggie burgers, and milkshakes

The Point Grill (16)

Burgers and sandwiches, salads, local seafood, and an outdoor patio to enjoy the sun

Sage (17)

Healthy, modern West Coast cuisine paired with breathtaking views.

Mercante (24)

Authentic Cucina Italiana, stone oven Italian pizza, salads, pasta, soups and desserts

Coffee Shops

Tim Hortons (18) Bean Around the World (19) Starbucks (20) The Boulevard Coffee Roasting Co (21) Great Dane Coffee (22) The Well Café (23)

Quick-Service Cafés

These cafés, located in convenient spots across campus, offer a range of snacks and lunch items, including soups, sandwiches, salads, and a variety of hot dishes

Caffe Perugia (4)	Café MOA (6)	lke's Café (8)	Law Café (10)	The Loop Café (12)
Niche Café (5)	Pharmacy Café (7)	Magma Café (9)	Reboot Café (11)	Stir It Up Café (13)



Map Directory

Site or Building Name & Address	Grid
Abdul Ladha Science Student Ctr, 2055 East Mall	D4
Acadia/Fairview Commonsblock, 2707 Tennis Cres	G7 G7
Acadia Park Residence	F/H-6/7
Acadia Park Highrise, 2/25 Melta Kd	G/ H7
Allard Hall [Faculty of Law], 1822 East Mall	B4
Anthropology & Sociology Bldg, 6303 NW Marine Dr	A3
Aquatic Centre, 6121 University Blvd Aquatic Ecosystems Research Lab (AERL) 2202 Main Mall	D5 F3
Asian Centre, 1871 West Mall	B2
Auditorium (a.k.a. "Old Auditorium"), 6344 Memorial Rd	C3
Auditorium Annex Offices, 1924 West Mall Barn (davcare), 2323 Main Mall	C3 F3
3.C. Binning Studios (formerly Hut M-17), 6373 University Blvd	D3
Beaty Biodiversity Centre & Museum, 2212 Main Mall	E3/4
3elkin (Morris & Helen) Art Gallery, 1825 Main Mall Berwick Memorial Centre, 2765 Osovoos Cres	B3 G6
Bioenergy Research & Demonstration Bldg., 2337 Lower Mall	
Biological Sciences Bldg [Science Faculty office], 6270 University	/ BlvdD3
Biomedical Research Ctr, 2222 Health Sciences Mail	E4
Bollert (Mary) Hall, 6253 NW Marine Dr	
Bookstore, 6200 University Blvd	D4
Botanical Garden Centre/Gatehouse, 6804 SW Marine Dr	H1
Botan. Gard. Greenhses/ Workshops, 6088 S. Campus RdS	South Campus
Brimacombe Building, 2355 East Mall	F4
BROCK HALL: Student Services & Welcome Centre, 1874 Ea	st Mall C4
Buchanan Building (Blocks A, B, C, D, & F) [Arts], 1866 Main Ma	04 II B3/4
Buchanan Tower, 1873 East Mall	C4
K. Choi Building for the Institute of Asian Research, 1855 West	t Mall B2
Campus & Community Planning, 2210 West Mall	E3
Carey Centre, 5920 Iona Drive	B6
Carey Theological College, 1815 Wesbrook Mall	B6
CAWP (Centre for Advanced Wood Processing), 2424 Main Mall	F4
Cecil Green Park House, 6251 Cecil Green Park Rd	A3
CEME — see Civil & Mechanical Engineering Building	
Centre for Comparative Medicine, 4145 Wesbrook Mall	South Campus
Centre for Interactive Research on Sustainability (CIRS), 2260 W	est Mall E3 F4
Chan Centre for the Performing Arts, 6265 Crescent Rd	B4
Chancellor Place neighbourhood	B5
Chemical & Biological Engineering Bldg, 2360 East Mall	F4 Blvd D4
Chemistry B.C,D & E Blocks, 2036 Main Mall	D3
Child Care Services Administration Bldg, 2881 Acadia Rd	H7
Child Care Services Bldgs, Osoyoos Cresc and Revelstoke Crt CIRS — see Centre for Interactive Research on Sustainability	H/
Civil & Mechanical Engineering Bldg (CEME), 6250 Applied Science	nce Lane E4
Civil & Mechanical Eng. Labs ("Rusty Hut"), 2275 East Mall	E4
Coal & Mineral Processing Lab, 2332 West Mall	E3
Copp (D.H.) Building, 2146 Health Sciences Mall	D2
Cunningham (George) Building [Pharmaceutical Sc.], 2146 East	Mall E4
David Lam Learning Centre, 6326 Agricultural Rd	C3
Donald Rix Building, 2389 Health Sciences Mall	
Doug Mitchell Thunderbird Sports Centre, 6066 Thunderbird Blvc	JG5
Dorothy Somerset Studios (formerly Hut M-18), 6361 University E	3lvdD3
Earth & Ocean Sciences (EOS) under construction, 2207 Main Ma Earth & Ocean Sciences (EOS) - Main and South, 6339 Stores R	a⊪E3 ≳dE3
Earthquake Engineering Research Facility (EERF), 2235 East Ma	all E4
Engineering High Head Room Lab, 2225 East Mall	E4
English Language Institute (E.L.I.) — see Continuing Studies But Environmental Services Facility, 6025 Nurseries Rd	ioing South Campus
airview Crescent Residence, 2600-2804 Fairview Cres	F6
ire Department, 2992 Wesbrook Mall	H6
-irst Nations Longhouse, 1985 West Mall	C2
Food, Nutrition and Health Bldg, 2205 East Mall	
orest Sciences Centre [Faculty of Forestry], 2424 Main Mall	F4
Forward (Frank) Building, 6350 Stores Rd	E3
Plnnovations (Pulp & Paper Division), 3800 Wesbrook MallS	South Campus
raser Hall (public rental housing), 2550 Wesbrook Mall	G6
Fraternity Village, 2880 Wesbrook Mall	H6
Friedenic Wood Theatre, 6354 Crescent Rd	вэ Е5
Gage Residence, 5959 Student Union Blvd	C5
General Services Administration Bldg (GSAB), 2075 Wesbrook N	1all D5
beography bullding, 1904 West Mall Gerald McGavin Building, 2386 Fast Mall	C3
Graduate Student Centre — see Thea Koerner House	
Green College, 6201 Cecil Green Park Rd	
preenneart Canopy warkway, Botanical Garden, 6804 SW Marin Greenwood Commons (public rental housing), 2660 Westrook M	е ∪гH1 1all С6
ampton Place neighbourhood	H/J-6/7
Hawthorn Place neighbourhood	G/H3
1eod Building, 2045 East Mall Teonings Building, 6224 Agricultural Rd	D4
Henry Angus Building [Sauder School of Business], 2053 Main M	lallD3

Site or Building Name & Address	Grid
Hillel House - The Diamond Foundation Centre for Jewish Cam	pus Life,
6145 Student Union Blvd	C4
Horticulture Building/Greenhouse, 6394 Stores Rd	E2/3
Hugh Dempster Pavilion, 6245 Agronomy Rd	F4
CICS/CS (Institute for Computing, Information	
& Cognitive Systems/Computer Science), 2366 Main Mall	F4
nstructional Resources Centre (IRC), 2194 Health Sciences Ma	all E5
nternational House, 1783 West Mall	B2
n-Vessel Composting Facility, 6035 Nurseries Road	South Campus
rving K. Barber Learning Centre, 1961 East Mall	C4
Jack Bell Building for the School of Social Work, 2080 West Ma	llD3
John Owen Pavilion & Allan McGavin Sports Medicine Centre,	
3055 Westrook Mall	H5
Naiser (Fred) Building [Faculty of Applied Science], 2332 Main I	VialiE3
(de Club 2955 Acadia Dd	D3
(lingk (Loopard S.) Plda, 6356 Agricultural Pd	G/
Koerner (Walter C.) Library 1958 Main Mall	
andscane Architecture Anney, 2371 Main Mall	
asserre (Frederic) Building, 6333 Memorial Rd	
aw Faculty of - see Allard Hall	
eon and Thea Koerner University Centre, 6331 Crescent Rd	B3
Life Sciences Centre, 2350 Health Sciences Mall	F5
Liu Institute for Global Issues, 6476 NW Marine Dr	B2
Lower Mall Header House, 2269 Lower Mall	E2
Lower Mall Research Station, 2259 Lower Mall	E2
Macdonald (J.B.) Building [Dentistry], 2199 Wesbrook Mall	E5
MacLeod (Hector) Building, 2356 Main Mall	F3
MacMillan (H.R.) Bldg [Faculty of Land & Food Systems], 2357	Main Mall F3
Marine Drive Residence (Front Desk in Bidg #3), 2205 Lower M	allE2
Material Recovery Facility, 6055 Nurseries Ro	South Campus
Mathematics Annex, 1900 Mathematics Rd	
Medical Sciences Block C 2176 Health Sc Mall	
MEA Studios (formerly B.C. Binning MEA Studios) 6363 Store	s Rd F3
Michael Smith Laboratories 2185 East Mall	D4
Museum of Anthropology (MOA), 6393 NW Marine Dr	
Music Building, 6361 Memorial Rd	B/C3
Networks of Ctrs of Excellence (NCE), 2125 East Mall	D4
Nitobe Memorial Garden, 1895 Lower Mall	B/C2
Nobel Biocare Oral Heath Centre (David Strangway Bldg),	
2151 Wesbrook Mall	E5
Norman MacKenzie House, 6565 NW Marine Dr	B2
NRC Institute for Fuel Cell Innovation, 4250 Wesbrook Mall	South Campus
Uld Administration Building, 6328 Memorial Rd	
Old Auditorium — See Auditorium	C 2
Old Barn Community Centre, 0000 Thunderbird Biva	
Orchard House, 2336 West Mall	
Osborne (Robert F) Centre/Gvm 6108 Thunderbird Blvd	
Panhellenic House, 2770 Wesbrook Mall	
Peter Wall Institute for Advanced Studies, 6331 Crescent Rd	B3
Place Vanier Residence, 1935 Lower Mall	C/D2
Plant Ops Nursery/Greenhouses, 6029 Nurseries Rd	South Campus
Plant Science Field Station & Garage, 2613 West Mall	H2

	Point Grey Apartments, 2875 Osoyoos Cresc	H6
	Police (RCMP) & Fire Department, 2990/2992 Wesbrook Mall	H6
	Ponderosa Centre, 2071 West Mall.	D2
	Ponderosa Office Annexes: A, B, & C, 2011-2029 West Mall	C/D2
	Ponderosa Office Annexes: E to H, 2008-2074 Lower Mall	C/D2
	Power House, 2040 West Mall	D3
	Pulp and Paper Centre, 2385 East Mall	
	Ritsumeikan-UBC House 6460 Agronomy Rd	F2
	Rose Garden	B3
	Roy Barnett Recital Hall - in Music Building	
	Rugby Pavilion 2584 East Mall	G4
	Scarfe (Neville) Building [Education] 2125 Main Mall	
	School of Population & Public Health (SPPH) 2206 East Mall	
	Simon K V Lee HKULUBC House - Bldg #1 Marine Drive Res	idence E2
	Sing Tao Building, 6388 Crescent Rd	R3
	Sopron House 2730 Acadia Rd	G7
	South Campus Warehouse, 6116 Nurseries Rd	South Campus
	Spirit Park Apartmente, 2705 2725 Osoucos Cross	
	St Andrew's Hall/Residence 60/0 long Dr	
	St. John's College 2111 Lower Mall	
	St. Mark's College, 5035 Jona Dr.	
	Staning Research Centre 60/5 Nurseries Rd	South Campus
	Stores Dead Anney, 6368 Stores Dd	
	Student Decreation Ctr. 6000 Student Union Blud	L.
	Student Lipion Bldg (SLIP), 6138 Student Lipion Blvd	
	TEE3 (Tochoology Enterprise Escility 3) 6100 Agronomy Pd	
	Thes Keerner House [Eaculty of Graduate Studies] 6371 Cross	ont Dd 83
	Theatro Film Droduction Pldg. 6259 University Plvd	
	Theaderbird Decidence, 6225 Thunderbird Cross	D3
	Thurderbird Residence, 0555 Thurderbird Cresc	۲۵/4
	Thunderbird Stadium, 6200 Stadium Rd	d Sporte
	Totom Field Studios, 2613 West Mall	и эронз
	Totem Dark Desidence, 2525 West Mall	E/C2
	TDIUME 4004 Weekreek Mell	South Comput
	TRIDIVIE, 4004 WESDIOOK Wall	
	IIBC Bookstore 6200 University Blvd	Divu
	UBC BOOKSTOLE, 0200 UTIVEISITY DIVU	South Comput
	UDC Fallil, 0102 Westilook Wall	
	UBC Hospital, 2211 Westfook Mali	E3
	UBC Terrinis Centre, 6160 Thuriderbird Biva	
	UBC Thuriderbild Arena (In Doug Mitchell Centre), 2000 Weshing	OOK IVIAIIG3
	University Centre (Leon & Thea Roeniet), 0331 Crescent Ru	South Comput
	University Neighbourhoods Association, 5925 Berton Ave	
	Versey vest Mail	E2
	Vancouver School of Theology, 6000 Iona Drive	B3
	Walter H. Gage Residence, 5959 Student Union Biva	
	War Memorial Gymnasium, 6081 University Bivd	
	wayne & william white Engineering Design Ctr, 2345 East Mail	E4
	Wesbrook Bldg, 61/4 University Blvd	
	Westrook Place neighbourhood	South Campus
	vvesbrook village shopping centre	South Campus
	west Mail Annex, 1933 West Mail	C2
	vvest viaii Swing Space Bldg, 21/5 West Mail	D2
	Wood Products Laboratory, 2324 West Mall	E3
	Woodward IRC, 2194 Health Sciences Mall	E4/5
	Woodward Library, 2198 Health Sciences Mall	E4/5
-		

Site or Building Name & Address

Grid



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Note:

 Local traffic only
along Wesbrook Mall on South Campus

Map Information

Need help finding your way on campus? Call the Campus & Community Planning MapInfo Line at 604-827-5040, M-F, 8:30-4:30

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