General University Information
President: Todd A. Diacon
Dean of Graduate School: Lana Whitehead, Assistant Dean
University website: http://www.kent.edu/
School Type: Public
Setting: Suburban
Total Faculty: 2,579
Total Graduate Faculty: 1,368
Total number of Students: 38,323
Total number of Graduate Students: 5,570

Department Information
Department Chair: Prof. James Gleeson, Chair
Department Contact: John Portman, Professor & Graduate Coordinator
Total full-time faculty: 30
Total number of full-time equivalent positions: 30
Full-Time Graduate Students: 70
Female Full-Time Graduate Students: 6
First-Year Graduate Students: 9
Female First-Year Students: 1
Total Post Doctorates: 5

Department Address
Smith Hall
Kent State University
Kent, OH 44242
Phone: (330) 672-2246
Fax: (330) 672-2959
E-mail: PhysGPC@kent.edu
Website: http://www.kent.edu/physics

ADMISSIONS

Admission Contact Information
Address admission inquiries to: Cartwright Hall, 650 Hilltop Dr., Kent, OH 44242
Phone: (330) 672-2661
E-mail: gradapps@kent.edu
Admissions website: http://www.kent.edu/graduatestudies/admissions

Application deadlines
Fall admission:
U.S. students: January 31
Int’l. students: January 31
Spring admission:
U.S. students: August 31
Int’l. students: August 31

Application fee
U.S. students: $45
Int’l. students: $70
Admissions with TA support are offered almost exclusively to Fall applicants. Application materials include: online application form, CV, Goals statement, three letters of recommendation, transcripts, GRE scores, Physics GRE (highly recommended), TOEFL scores (if applicable).

Admissions information
For Fall of 2019:
Number of applicants: 73
Number admitted: 19
Number enrolled: 9

Admission requirements
Bachelor’s degree requirements: Bachelor’s degree in Physics or closely related major.
Minimum undergraduate GPA: 3.0

GRE requirements
The GRE is required. There is no minimum GRE score.

GRE Physics requirements
The GRE Physics is recommended. The Physics GRE is not required but highly recommended to be competitive. The Physics GRE is expected for all domestic applicants with undergraduate degrees. Advanced students can submit graduate course work and research experience instead of GRE. There is no minimum score for Physics GRE.

TOEFL requirements
The TOEFL exam is required for students from non-English-speaking countries.
Minimum accepted TOEFL scores:
PBT score: 550
iBT score: 79

Other admissions information
Undergraduate preparation assumed: Mechanics: Marion or Taylor; Electricity and Magnetism: Griffiths; Quantum Mechanics: Griffiths; Thermal Physics: Schroder; at least one advanced laboratory course.

TUITION AND ASSISTANTSHIPS

Teaching Assistants, Research Assistants, and Fellowships
Number of first-year
Teaching Assistants: 9
Average stipend per academic year
Teaching Assistant: $21,650
Research Assistant: $24,720
Graduate Assistants can receive a $500 Tuition Advance three weeks prior to their first pay check.

Tuition year 2019–2020:
Tuition for in-state residents
Full-time students: $9,090 annual
Part-time students: $505 per credit
Tuition for out-of-state residents
Full-time students: $19,362 annual
Part-time students: $881 per credit
Credit hours per semester to be considered full-time: 8
Health insurance: Available at the cost of $516 per year.
Other academic fees: A $10 Legal Fee and $20 International Student Activity Fee are charged per term.
Academic term: Semester
Number of first-year students who received full tuition waivers: 9

FINANCIAL AID

Application deadlines
Fall admission:
U.S. students: December 1
Ohio

**LOANS**

Loans are available for U.S. students. 
Loans are not available for international students. 
GAPSFAS application required: No 
FAFSA application required: Yes

**For further information**

Address financial aid inquiries to: PO Box 5190, 103 Schwartz Center, 800 E. Summit St., Kent, OH 44242. 
Phone: (330) 672-2972 
E-mail: finaid@kent.edu 
Financial aid website: [http://www.kent.edu/financialaid](http://www.kent.edu/financialaid)

**HOUSING**

Availability of on-campus housing

Single students: No
Married students: No
Childcare Assistance: No

For further information

Address housing inquiries to: 1425 Petrarca Drive, Kent State University, Kent, Ohio 44242. 
Phone: 330-672-7000 
E-mail: housing@kent.edu 
Housing aid website: [http://www.kent.edu/financialaid/housing](http://www.kent.edu/financialaid/housing)

**Table A—Faculty, Enrollments, and Degrees Granted**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Master’s</td>
<td>Doctorate</td>
</tr>
<tr>
<td>Biophysics</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Nuclear Physics</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Quantum Condensed Matter</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Soft Condensed Matter</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Non-specialized</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Full-time Grad. Stud.</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>First-year Grad. Stud.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**GRADUATE DEGREE REQUIREMENTS**

Master’s: The Master of Arts (M.A.) in Physics is a highly flexible program consisting of 32 hours of graduate coursework that can be customized according to the academic background and needs of the individual student. The Master of Science (M.S.) in Physics consists of 32 hours of graduate coursework and a research project taking one or two semesters. The research project should result in a written report. Students may choose to complete a thesis which is to be defended orally.

Doctorate: The Doctor of Philosophy (Ph.D.) in Physics provides training of professionals to conduct independently conceived programs of research or teaching in universities or research laboratories. Original research is required in fundamental or applied areas of physics, and the Ph.D. dissertation must be orally defended. Two years of graduate coursework, plus four years of research are typical. The required physics courses will prepare the student for the candidacy examination. Students present at least one seminar based on their dissertation research during their graduate career.

**SPECIAL EQUIPMENT, FACILITIES, OR PROGRAMS**

Available techniques in experimental condensed matter physics at Kent State University include nonlinear optics, electro-optics, tunneling and atomic force microscopy, nuclear magnetic resonance, electron paramagnetic resonance, x-ray scattering, light scattering, microcalorimetry, millikelvin refrigeration, SQUID magnetometry, and magnetoresistance and Hall effect measurement. The condensed matter group is also equipped with state-of-the-art equipment for experimental electronic and nuclear magnetic resonance, and neutron spin spectroscopy experiments in U.S. and abroad, such as the Spallation Neutron Source (SNS) at the Oak Ridge National Laboratory in Tennessee, the NIST Center for Neutron Research (NIST) in Maryland, the Paul Scherrer Institut (PSI) in Switzerland and the Rutherford Appleton Laboratory (ISIS) in U.K.

Many of the condensed matter faculty at Kent State University are affiliated with the Glenn H. Brown Liquid Crystal Institute (LCI), the only institute of its kind in the United States. Located on the Kent Main Campus, the LCI provides materials synthesis and characterization facilities, and includes a prototype facility with a 2,500 sq. ft. clean room. In addition, faculty and students in the soft matter area utilize the facilities, instruments, and beam lines at the National High Magnetic Field Laboratory (MagLab) in Florida and the Advanced Light Source (ALS) at Lawrence Berkeley National Lab.

The nuclear physics faculty participate in experiments at National and International Laboratories, or perform related theoretical calculations. Current activities are centered at Jefferson Laboratory (JLab) in Virginia, Brookhaven National Laboratory (BNL) in New York, and the MAMI facility at Mainz in Germany. After completing their coursework, students in this area of experimental typically spend significant portions of their time at these National Laboratories to work on development and commissioning of new detectors. The astrophysics faculty performs research which is directly connected to the measurement of compact star properties using terrestrial facilities, such as in the Arecibo Observatory, and space-based facilities, such as the NICER (Neutron star Interior Composition Explorer) mission payload on the International Space Station.

Activities in the area of nuclear/particle physics are promoted by the Physics Department’s Center for Nuclear Research (CNR).

The biophysics faculty members perform computational and experimental work on protein folding, allosteric conformational changes in protein structure, DNA/RNA structure, and DNA-protein interactions. In addition to in-house protein purification and characterization instruments and fluorescence microscopes with single molecule detection capability, researchers also have access to an on-campus Image and Visualization Center, cell culture facility, DNA microarray, and circular dichroism spectropolarimeter with temperature control capability. Computational work is conducted on clusters maintained by individual research groups, the College of Arts and Sciences, as well as resources at the Ohio Supercomputer Center.

The Physics Department is located in Smith Hall in the heart of Kent State University’s Science Complex. A professionally staffed Machine Shop and an Electronics Shop in Smith Hall provide a diverse range of support for experimental groups. In addition, a student machine shop is available for educational and research projects. Many additional facilities of relevance to experimental work in soft condensed matter physics are available.
in the Liquid Crystal Institute. Several faculty members will move to the Integrated Sciences Building to be completed by the Fall 2017 semester, which will have equipment and resources for biophysics and soft matter research, including -80 °C freezers, spectrophotometers, autoclave instrument, and temperature controlled 4 °C and 37 °C rooms.

### Table B—Separately Budgeted Research Expenditures by Source of Support

<table>
<thead>
<tr>
<th>Source of Support</th>
<th>Departmental Research</th>
<th>Physics-related Research Outside Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government</td>
<td>$1,968,160</td>
<td></td>
</tr>
<tr>
<td>State/local government</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-profit organizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business and industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>$1,968,160</td>
</tr>
</tbody>
</table>

### Table C—Separately Budgeted Research Expenditures by Research Specialty

<table>
<thead>
<tr>
<th>Research Specialty</th>
<th>No. of Grants</th>
<th>Expenditures ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biophysics</td>
<td>1</td>
<td>$62,709</td>
</tr>
<tr>
<td>Quantum Condensed Matter</td>
<td>7</td>
<td>$408,234</td>
</tr>
<tr>
<td>Soft Condensed Matter</td>
<td>16</td>
<td>$766,540</td>
</tr>
<tr>
<td>Nuclear and Particle Physics</td>
<td>8</td>
<td>$730,677</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>32</td>
<td>$1,968,160</td>
</tr>
</tbody>
</table>

### FACULTY

**Professor**

Almasan, Carmen, Ph.D., University of S. South Carolina, 1989. Assistant to the Chair. Condensed Matter Physics, Low Temperature Physics. Carmen Almasan’s recent projects include: experimental condensed matter physics; superconductivity; cuprates; heavy fermions; magnetism; non-fermi liquid behavior; pnicotides.

Bos, Philip J., Ph.D., Kent State University, 1978. Applied Physics, Engineering Physics/Science, Nano Science and Technology, Optics, Other. Philip Bos’ recent projects have involved liquid crystal based displays, optical wavefront controllers, lenses, and Pancharatanam phase devices. Students have found employment at: Motorola, Intel, Apple, Google, Facebook/Oculus, Samsung, Fuji Film, 3M, Eastman Chemical, Compound Photonics, Z-space, KDI, Lincoln Laboratory, and other places.

Gleeson, James T., Ph.D., Kent State University, 1991. Chair of the Physics Department. Biophysics, Condensed Matter Physics, Polymer Physics/Science, Statistical & Thermal Physics. James Gleeson’s recent projects involve experimental soft condensed matter; complex fluids; liquid crystals; polymers; proteins and DNA.

Jakli, Antal, Ph.D., Loránd Eötvös University, 1986. Director of the Chemical Physics Graduate Program. Chemical Physics, Condensed Matter Physics, Fluids, Rheology, Optics. Antal Jakli’s research at the Liquid Crystal Institute focuses on the physical properties of soft matter with special emphasis on bent-core liquid crystals, piezoelectricity and ferroelectricity. He has developed two new graduate courses for the Chemical Physics Interdisciplinary Program at KSU and incorporated them into a textbook, “One and two dimensional fluids,” co-authored with A. Sauge (Taylor&Francis, 2006). He co-authored nearly 250 peer-reviewed papers and 10 book chapters, and holds 18 US patents. Since 2009 he is an associate Ed. of Phys. Rev. E handling liquid crystal papers.

Katramatou, A. Mina T., Ph.D., The American University, Washington, DC, 1988. Nuclear Physics, Physics and other Science Education. Mina Katramatou’s research includes experimental nuclear physics; and the structure of light nuclei.

Keane, Declan, Ph.D., University College Dublin, 1981. Accelerator, Nuclear Physics. Declan Keane’s research group specializes in the experimental study of high-energy nucleon-nucleus collisions, and searches for new antimatter nuclei. Group members use measurements of anisotropy among emitted particles to learn about fluid-like behavior and phase transitions in the dense and highly excited matter created in these collisions.


Manley, D. Mark, Ph.D., University of Wyoming, 1981. Undergraduate Coordinator. Nuclear Physics. Mark Manley is an experimental nuclear physicist whose main research interests involve carrying out multichannel energy-dependent partial-wave analyses with the goal of determining resonance parameters in a consistent and accurate manner.

Mann, Elizabeth, Ph.D., Universite Pierre et Marie Curie (Paris VI), 1992. Applied Physics, Biophysics, Chemical Physics, Condensed Matter Physics, Fluids, Rheology, Nonlinear Dynamics and Complex Systems, Optics, Polymer Physics/Science, Statistical & Thermal Physics, Surface Physics. Elizabeth Mann’s research interests include lipid, liquid crystalline, and macromolecular films at interfaces: hydrodynamics, transport, phase separation, pattern formation, orientation, optics, line tension, linactants, biosensors.


Quader, Khanderi F., Ph.D., SUNY at Stony Brook, 1983. Condensed Matter Physics, Low Temperature Physics, Theoret-

Selinger, Robin L. B., Ph.D., Harvard University, 1989. Computational Physics, Condensed Matter Physics, Materials Science, Metallurgy, Polymer Physics/Science, Statistical & Thermal Physics, Theoretical Physics. Modeling and simulation of soft matter: liquid crystals, lipid membranes, liquid crystal elastomers. Molecular scale, mesoscale, and continuum simulation techniques. Topological defects and their role in transport, microstructure, and shape evolution. Recent work has focused on liquid crystal elastomers, a novel class of stimuli-responsive materials that can be programmed to undergo autonomous deformation when heated or illuminated. (ORCID: 0000-0002-6519-9685)

Sprunt, Samuel N., Ph.D., Massachusetts Institute of Technology, 1989. Biophysics, Condensed Matter Physics, Polymer Physics/Science, Statistical & Thermal Physics, Surface Physics. Samuel Sprunt specializes in experimental soft matter physics; complex fluids; liquid crystals; proteins and DNA; phase transitions; optical properties of complex dielectric media; thin films.

Strickland, Michael, Ph.D., Duke University, 1997. Director of the Center for Nuclear Research. Computational Physics, High Energy Physics, Nuclear Physics, Plasma and Fusion, Theoretical Physics. Michael Strickland is a theoretical physicist who specializes in high-energy particle physics, heavy ion collisions, and finite temperature/density quantum field theory. Michael’s primary interest is the physics of quark-gluon plasma (QGP). These plasmas are predicted by quantum chromodynamics (QCD) to have existed until approximately one microsecond after the big bang and are currently being studied terrestrially by experimentalists at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Labs and the Large Hadron Collider (LHC) at CERN. These exciting experiments are increasing our knowledge of the behavior of matter under extreme conditions.

Wei, Qi-Huo, Ph.D., Nanjing University. Applied Physics, Chemical Physics, Condensed Matter Physics, Nano Science and Technology, Optics, Other. Qi-Huo Wei heads a dynamic group with a multidisciplinary background. Their research is aimed at fundamental understanding of soft materials confined in low dimensions, advanced manufacturing for new soft material engineering, and device applications in a variety of fields. Our current projects include stimuli-responsive and active soft matter, liquid crystal polymers, topological defects, plasmonic photopatterning of molecular orientations, and 3D and 4D printing.

Yang, Deng-Ke, Ph.D., University of Hawaii, 1989. Applied Physics, Chemical Physics, Optics, Other. Deng-Ke Yang’s specialties include cholesteric liquid crystals, liquid crystal/polymer composites and electro-optic devices. He is co-inventor of bistable cholesteric display (BCD) technology, currently the world’s most promising technology for electronic paper.

Yokoyama, Hiroshi, Ph.D., Tokyo Institute of Technology, 1987. Ohio Research Scholar. Applied Physics, Condensed Matter Physics, Nano Science and Technology, Surface Physics. Hiroshi Yokoyama has been active in research and education for nearly 40 years in the area of nano-science and technology of soft matter, particularly liquid crystals. His research interest has a wide spectrum from experimental and theoretical study on liquid-crystal surfaces, self-organization and nonequilibrium phenomena in soft condensed matter, to scanning probe microscope instrumentation. He is the former director of the Glenn H. Brown Liquid Crystal Institute from 2011 to 2018. He is currently the President of the International Liquid Crystal Society.

Associate Professor


Dzero, Maxim, Ph.D., Florida State University, 2003. Condensed Matter Physics, Theoretical Physics. Maxim Dzero’s research interests include theoretical condensed matter physics; strongly correlated quantum systems; many body physics; superconductivity; quantum phase transitions; magnetism; disordered systems; non-equilibrium dynamics of glassy systems.


Schroeder, Almut, Ph.D., University of Karlsruhe, 1991. Condensed Matter Physics, Low Temperature Physics, Materials Science, Metallurgy, Solid State Physics. Almut Schroeder studies strongly correlated electron systems, transition metal alloys and heavy fermion compounds, close to quantum phase transitions with experimental tools such as low temperature magnetic susceptibility and transport measurements at KSU and with neutron scattering and muon spin resonance at National Facilities.

Assistant Professor

Dexheimer, Veronica, Ph.D., Johann Wolfgang Goethe University, 2009. Associate Director of the Center for Nuclear Research. Astrophysics, Computational Physics, Electromagnetism, High Energy Physics, Nuclear Physics, Particles and Fields, Relativity & Gravitation, Statistical & Thermal Physics, Theoretical Physics. Veronica Dexheimer and her group develop mathematical models to describe the interior of neutron stars, including stages of their evolution and phase transitions that occur in layers of the star. Transitions between the hadronic phase (containing neutrons, protons, electrons and hyperons) and possible quark phase leave signatures on macroscopic observables in the star, such as mass, radius, rotation frequency, surface temperature, magnetic field. These signatures can help us to observe stable deconfined quark matter, the most extreme new kind of matter, for the first time in our universe.

Fregoso, Benjamin, Ph.D., University of Illinois at Urbana-Champaign, 2010. Condensed Matter Physics, Theoretical Physics. Benjamin Fregoso specializes in Theoretical Con-
Densed Matter Physics: Quantum Liquid Crystal Phases; Quantum Magnetism; Superconductivity; ferroelectricity.

Schmidt, Thorsten L., Ph.D., Johann Wolfgang von Goethe University, Frankfurt, 2010. Biochemistry, Biophysics, Chemical Physics, Nano Science and Technology, Polymer Physics/Science. Thorsten Schmidt’s lab develops DNA nanotechnology based tools and devices for applications in biophysics, molecular biology, nanomedicine, material science, and nano photonics. Furthermore, we develop a “next generation DNA synthesis” technology for oligonucleotides and de novo gene synthesis. (ORCID: 0000-0002-6798-5241)

DEPARTMENTAL RESEARCH SPECIALTIES AND STAFF

Theoretical
Astrophysics. Neutron star formation; neutron star equation of state; supernovae dynamics; supernovae equation of state; gravitational waves. Dexheimer.

Biophysics. Theoretical and computational models of protein dynamics, protein folding and binding, allostery, and intrinsically disordered proteins. Portman.

Nuclear and Particle Physics. Quark-gluon plasma; quantum chromodynamics; relativistic heavy ion collisions; finite temperature field theory; relativistic hydrodynamics; relativistic transport; nuclear equation of state. Dexheimer, Strickland.

Quantum Condensed Matter. Strongly correlated electrons; ultra-cold fermions and bosons; quantum fluids; emergent phenomena; superfluidity; superconductivity; quantum phase transition; quantum critical point; non-equilibrium physics; low temperature transport/magneto-transport; quantum many-body techniques; density functional method; dynamical mean-field theory. Dzero, Fregoso, Quader.


Experimental

Nuclear and Particle Physics. Structure of light nuclei; electromagnetic form factor measurements; hadronic physics; heavy ion collisions. Katramatou, Keane, Manley, Margetis, Petratos.

Quantum Condensed Matter. Strongly correlated electrons; superconductivity; quantum phase transition; quantum critical point; low temperature transport/magneto-transport; neutron scattering; muon-spin resonance; charge transport; organic semi-conductors; photovoltaics. Almasan, Ellman, Fregoso, Lüssem, Lavrentovich, Schroeder.


View additional information about this department at www.gradschoolshopper.com. Check out the “Why Choose Us?” section, find out more about the department’s culture and get links to social media networks.