It is with great pleasure that we share with you this, our second Annual Report under the new Western Research Parks banner. This Report, entitled “Discover” speaks to the continued transformation of Western Research Parks into innovation hubs; where talent and technology, industry and invention, dreams and discoveries converge to create leading-edge solutions for the benefit of our world and our future.

Since the commissioning of its first Park 25 years ago, Western University has been unwavering in its commitment to build a bridge between research and commerce, and a place where ideas can be transformed into enterprises that generate economic value throughout the region and social good around the world.

So it should not be surprising that 25 years later, Western, which now owns or is affiliated with three Research Parks, can lay claim to an impressive track record of applied research and entrepreneurial success. It can also proudly boast of an equally impressive roster of marquee tenants, including several industry leaders in each of their respective sectors.

Western’s Parks program is also proud to share with you a number of material advancements and crowning achievements over the past year.

These include:

- the opening of Western’s new 66,000 square foot WindEEE Dome at Western’s Advanced Manufacturing Park, the first 3D wind engineering facility of its kind in the world.
- the opening of Western’s new 27,000 square foot Collider Centre for Technology Commercialization at the Advanced Manufacturing Park, an incubator that will serve as the nerve centre for the next generation of manufacturing in Canada.
- the addition of business outsourcing provider Atelka and its 300 new jobs at Western Sarnia-Lambton Research Park.
- the addition of Lambton College’s new Bluewater Technology Access Centre and Lambton Water Centre at the Sarnia-Lambton Park, the first such integrated college-university research centre of its kind in Canada.
- the doubling of Nova Chemicals’ space requirements at the Sarnia-Lambton Park.
- the opening of TechAlliance’s new Minimum Viable Products (MVP) Lab at Western Discovery Park, a facility designed to accelerate entrepreneurial product development and commercialization.
Collectively Western Research Parks now comprise one of the largest and most successful translational research enterprises in the world, all dedicated to the convergence of research, entrepreneurship, innovation and industry. In fact, Western Research Parks was recently recognized and ranked among the Top 25 University Business Incubators in the world by UBI Index, a Swedish research company that specializes in incubator evaluations.

While these noteworthy achievements are rewarding, much work still needs to be done and the management teams in both London and Sarnia-Lambton have no intention of resting on their laurels. Over the next twelve months, we hope to:

> secure funding support for Phase I of London’s new Medical Innovation and Commercialization Network at Discovery Park.

> secure additional land to allow for future expansion at Advanced Manufacturing Park.

> expand the Parks’ partnerships with Fanshawe College and Lambton College.

> secure additional funding for Bioindustrial Innovation Canada at the Sarnia-Lambton Park.

In addition, Western Research Parks hopes to extend its reach into the global market through its continued pursuit of new business partnerships with international commercial interests seeking to improve their ties to the region and its research capacity. Working in cooperation with the area’s top economic development organizations, Western Research Parks will work to leverage the region’s substantial institutional strengths to attract industry to our community and sustainable job opportunities for our citizens.

On the pages that follow, Western Research Parks is pleased to showcase a few of the Parks’ more notable success stories over the past year. We continue to recognize and respect the fact that our success is best reflected in the research, innovation and commercial accomplishments of our tenants. We have also highlighted some of our key performance metrics to help illustrate our progress over the past year and promise for the future.

Western Research Parks will continue to act as an enabler of economic and social good. We take great pride in our achievements to-date and look forward to delivering even more promising returns and results in the years to come.

Paul Paolatto
Executive Director
Western Discovery Park
Western Advanced Manufacturing Park

Tom Strifler
Executive Director
Western Sarnia-Lambton Research Park
Western Discovery Park is celebrating its 25th Anniversary this year. This is an impressive milestone for an entity that began with little more than a single tenant and a single investment and Western’s dream to make a greater contribution to the region’s economy.

Today, Discovery Park is valued at approximately $100 million and its tenants contribute millions more to the region’s economy through payrolls, new product development, client services and commercial engagement.

Moreover, Discovery Park is seeking to become home to the first phase of London’s new Medical Innovation and Commercialization Network, a $125 million team-based enterprise that will vault London to the forefront of medical advances globally. Clearly Discovery Park has delivered on its original mission of 25 years ago and remains as committed as ever to this purpose and its promise. What follows are a few of the Park’s more notable tenant success stories.

RENIX

The eco-advantage of ion exchange is that you soak up a chemical from somewhere it does not belong and recycle it for future use or safe discharge.

Christine Haas, co-founder and president of Renix, says their focus is on uninterrupted ion exchange for safe food, clean water and green chemicals. Renix was a classic start-up built on intellectual property from Western scientists. Their patent application evolved as their uninterrupted ion exchange process was industrialized. “We purify many types of liquids and use ion exchange resins to do that in a fluidized bed,” says Haas. “We do resin regeneration in a continuous process rather than batch processing. The resin is a moving, circulating bed. In most batch processing applications, resin beads are charged with ions and once beads are loaded you switch the equipment to a different mode to regenerate. The batch process is less efficient and prone to fouling.”

Renix expanded into lab space at the Stiller Centre and have over 10 pilot or demonstration-scale applications underway. They partner with London steel and plastic fabricators to custom build units configured to a specific client need. “We do proof of concept here in the lab and currently build demonstration scale units that sell for a few hundred thousand dollars,” says Haas. Full scale equipment will sell in the million dollar range.

Haas credits the Discovery Park for contributing to their early growth trajectory. “Being in the Park with the lab capacity, and having access to organizations like TechAlliance and WORLDiscoveries is very valuable,” she says. “We accelerated early on with their help. Just talking to the other companies in the Park doing the same thing is super valuable — like how to handle legal aspects, insurance and hazardous waste. The Park is our hub.”
In an effort to materially advance innovation and industry in London’s health care sector, leaders from across the city’s health care community have united around a single vision and a common purpose, namely to harness the expertise of some of the world’s top clinicians and scientists together with entrepreneurs and industry leaders to create a collaborative team-based network that will focus on resolving some of the world’s more challenging health care problems and then commercializing these advances for economic and social gain.

This new enterprise is called the London Medical Innovation & Commercialization (LMIC) Network and in a manner befit of such renowned, medically-intensive communities worldwide, London’s health care sector is uniquely positioned to realize this vision and contribute immensely to a healthier world and a wealthier local economy.

Specifically, London’s leaders seek to expand upon the community’s extensive health care strengths by establishing the LMIC Network as a cross-discipline, world-class enterprise that will initiate, validate, translate and commercialize medical research and discoveries into market-ready health care solutions that generate employment and investment, prosperity and civic pride.

To accomplish this vision, the Network has identified and prioritized those areas of medical research in London that best lend themselves to immediate and impactful innovation and commercialization opportunities. They include: Musculoskeletal and Brain Health, Bio-Medical Devices and Advanced Simulation, and Bio-Medical Imaging.

The Network next plans to surround each of these select fields of study with reputed commercial companies at the global and early stage level, linking them to the community’s top clinical testing and translational programs and focusing them on problem resolution and improved health care.

Finally, the Network expects to locate the enterprise at Western Discovery Park. The Park is ideally suited to accommodate the mix of science and industry and well positioned to augment the Network with support services and commercialization expertise.

Overall, the LMIC Network is committed to blending London’s research strengths with global commercial interests and local business ingenuity to create positive economic and social outcomes. Western Discovery Park is committed to enabling this vision and to delivering on its potential.
Can you really clean by flipping on a light? SunWash Technologies’ proprietary titanium dioxide formulations provide a prolonged sanitation effect activated by light – with sunlight and UV light the most effective end of the spectrum.

Patrick Therrien, with a background in chemical manufacturing, was an early believer in SunWash – a start-up out of Western Engineering. Therrien, a senior business manager at WorLDiscoveries, acted as their advisor and acquired an equity stake. He now manages SunWash to help commercialize the product.

Titanium dioxide is photocatalytic in the presence of a light source and helps to oxidize organic pollutants into harmless water and carbon dioxide molecules. “The IP is around how to bind it to a polymer – which is significant because it improves the catalytic effect. But catalysis from titanium dioxide degrades anything organic. So there is a real art to prevent self-degradation of the host product,” says Therrien. “Our product is now very good at balancing all of these properties. While we are currently focused on coatings, the technology also lends itself to molded parts and foams – that is our future.”

Therrien spent the past year tweaking formulations and putting infrastructure in place to manufacture SunWash. They make small batches of product in their Stiller Centre lab but their growth plan includes scaling up through contract manufacturers.

Therrien says they were very deliberate picking the food industry as their first target market because of food recalls in Canada from pathogens, like listeria. “We have had many successful trials in agri-food plants, as a major concern is cleanliness,” he says.

Dr. Ghenadie Rusu, a chemist from the Greater Toronto Area, needed lab space in August 2012 to transform his consulting business, Expert Synthesis Solutions, into a full-scale organic chemistry operation. His daughter Ruxanda, now a third year biochemistry student, was university shopping. As luck would have it, space was available at the Stiller Centre. “Ruxanda’s decision to come to Western made this transition so much easier,” he says. They both moved to London. Recently, his wife, also a chemist, and his other two daughters, Ana and Raluca, joined them to make this a true family business.

Expert Synthesis Solutions specializes in small-scale, high-value organic synthesis of complex molecules for a global marketplace. Rusu, with a long pharmaceutical industry career, says the company also develops and offers a range of unique specialty chemicals for pharmaceutical research: heterocyclic compounds, steroids, deuterated analogs of Active Pharmaceutical Ingredients, and others, all manufactured in their Stiller Centre lab.

Clients contact Expert Synthesis Solutions in search of an answer to a very specific problem such as synthesis of a rare compound. Rusu, who loves to solve what he calls the beautiful puzzles of chemistry, says research is his primary function. “In organic synthesis there may be several solutions to an existing problem. Our task is to find the cheapest, easiest and quickest fix – that often has to be developed on the spot,” he says.

Rusu appreciates fellow tenants in the Stiller Centre. “With some companies in the building we have developed a perfect symbiosis. We offer them our synthetic services and we use their analytical services in return,” he says. “It’s a win-win relationship for all. It helps us reduce the time and expenses for our customers and makes all our companies more competitive.”
As a Western graduate student in 2003, Amer Ebied designed a rubber bullet that was softer, less lethal and more accurate than those in common use. He parlayed that same chemical ingenuity into PolyAnalytik, a company he founded in 2007, that provides polymer testing and analytical services to industry and regulators including the U.S. Department of Agriculture and Canada Border Services Agency, to ensure food safety, drug efficacy and industry specific quality control.

Polymers have a wide range of properties and over time they can degrade and variances, some deadly, can occur. “We look at the molecular weight and size, the branching and the effect of their end-use properties,” Ebied says. “We confirm the molecular properties of the material down to less than 1 nanometer in size with high precision.”

PolyAnalytik is involved in evaluating generic drugs as well as new drug formulations to ensure they comply with regulations. “For example, the drug Heparin (to reduce blood clots) is made by numerous companies with very fine differences,” he says. “The FDA and Health Canada look for this information.”

PolyAnalytik’s Discovery Park location provides not just cost-effective lab space and specialized equipment, but access to Western’s chemists and engineering professors. “We don’t get easy research projects,” he says. “Companies contract us to do the R&D and the method development because they may not have the resources or skills to do it in-house. Even for multinationals, the systems used are expensive.”

Ebied says PolyAnalytik, with a staff of nine and a regular influx of Fanshawe and Western students, promotes a culture of entrepreneurship. “Every member of our team has the sense of ownership in the company,” he says. “Working with much larger enterprises, we have come to greatly value the family atmosphere that we enjoy at PolyAnalytik.”

Simalam’s client work that includes website design, app/mobile design and corporate branding.

Simalam is Malamis spelled backwards but the momentum for the firm, incorporated in 2010 and now with four employees, is on fast forward. His focus is to understand the problem the client wants to solve, always in digital and often in mobile media, tailor the content and measurement metrics and make sure the end-user experience is amazing. “The bigger the challenge the more we rise to the occasion,” says Malamis. “We make sure clients are clear about the marketing principles behind our work.”

Their office is crowded with equipment and young professionals. Simalam may have the only Discovery Park office where creative ideas get doodled on the walls. Malamis encourages a culture of curiosity. “We test one another’s assumptions and no one is infallible,” he says. “We are all about iterative design and customer feedback. We are brand engineers and try to understand how our clients make decisions.”

The Simalam team is community-minded and crowd-sources ideas for their pro-bono work. They mentor young students who need industry experience. “Every one of us is a transplant and we want to make London the best place to work in Canada,” says Malamis. “There is a ton of talent and we should keep more of it here.”
Western Advanced Manufacturing Park (AMP) is also engaged in a celebration this year, the opening of The Collider Centre for Technology Commercialization and with it the opening of AMP, a hub for the next generation of manufacturing throughout the region and across the country.
AMP was conceived in part with the express purpose of continuing Western’s impressive research legacy in such cutting edge fields of study as materials, wind, energy and the environment, all at an industrial scale. In just three years, AMP has effectively transformed a remote parcel of land into an exciting new campus focused on finding new means and new methods of restoring Canada’s manufacturing heartland to a leadership role on the world stage. What follows are a few of the promising new facilities and companies that expect to influence the nation’s manufacturing sector in the years to come.
This past June, Minister Gary Goodyear on behalf of the Canadian government, officially opened The Collider Centre for Technology Commercialization at Western’s Advanced Manufacturing Park. The new 27,000 square foot facility will serve as AMP’s initial headquarters and as a welcome centre to both large enterprises and early stage companies seeking to partner with Western, Fanshawe College and the City of London in a collective pursuit of new opportunities in the global manufacturing market.

The Collider, as the name implies, is specifically designed to stimulate collaboration or ‘collisions’ between research and industry in the hopes that such interactions will spawn new ideas, new inventions, new products and new companies. In addition, The Collider is expected to serve as an initial entry point for global companies looking to pursue manufacturing opportunities in the North American market. The hope is that once these global players experience the region and its wealth of knowledge-based and technology-based assets, they will look to establish a more permanent presence in the community and play a role in attracting other industry leaders to this market.

The Collider is already paying dividends. Two large players in the manufacturing sector have already set up satellite operations in the new facility and both anticipate that their presence in the Park will expand in the near future.

Western believes that The Collider is the first step on a path that most expect will lead to the first fully integrated university and college campus of its kind in Canada, and the first Park dedicated to the advancement of manufacturing in North America.
**DIEFFENBACHER**

Louis Kaptur is a recent Western graduate and engineer-in-training who conducts industrial scale R&D at Western’s Advanced Manufacturing Park. The Park is full of the world’s most powerful composite material production lines, including a Dieffenbacher 2,500 tonne hydraulic press. Kaptur optimizes Dieffenbacher’s processes at the Fraunhofer Project Centre for Composites Research and loves nothing better than to push the boundaries of their machines.

At Western, Dieffenbacher specializes in the forming of glass or carbon-fibre reinforced polymers and their Windsor, Ontario plant made the press used at the Park. “We design, manufacture and install fully automated hydraulic press lines and provide a turn-key solution for clients,” says Kaptur. “Dieffenbacher is expanding its portfolio of composite material processing technologies which can perform at production-scale cycle times.”

Kaptur appreciates Dieffenbacher’s close ties and alliance with Fraunhofer – Germany’s preeminent network of applied research, and Western’s partner at the AMP. “It’s a reciprocal relationship and a bridge between research and industry,” he says. “There are many benefits for Dieffenbacher by having a presence at the centre and working with Western University and Fraunhofer. This is a real showcase for our equipment where concepts can be proved, especially with new materials. For example, carbon fibre composites need to perform as well or better than the material it is replacing in strength and stiffness while reducing overall weight.”

Another clear benefit is the influx of engineers, technicians and scientists attracted to doing research at the Advanced Manufacturing Park. “There are many students my age coming in and we help each other,” says Kaptur. “I hope the Park builds as a training ground.”

**MOMENTIVE**

Composite materials resistant to the harshest conditions have taken us to outer space. Now, manufacturers are driving more earth-bound applications, particularly for carbon fibre. Momentive, a global leader in thermoset resins and specialty chemicals, is an important new tenant in Western’s Advanced Manufacturing Park. They bring expertise in developing lightweight solutions for automotive manufacturers using carbon fibre reinforced plastic (CFRP).

Stephen Greydanus, Momentive’s senior application development engineer at the Fraunhofer Project Center for Composites Research (FPC) at Western’s AMP, says legislated fuel efficiency in the U.S. is the catalyst for their client research and development. “Huge gains have been made in the last twenty years in engine performance and fuel efficiency,” he says. “To get more efficiency, the focus right now for automakers is to remove weight from the vehicle.”

The Park’s range of advanced manufacturing technologies is unique and allows Momentive to develop CFRP weight-saving solutions in a full-scale manufacturing process for structural and exterior automotive components that utilize specialty epoxies.

Greydanus says that the FPC is one of the only places in North America with high pressure resin transfer molding equipment, and combined with the capability of Dieffenbacher’s 2,500 tonne compression molding press, Momentive is able to inject fast curing epoxy resin into dry carbon fibre to make molded parts. “The Park, with the support of Fraunhofer, Dieffenbacher and other material suppliers, is vital for the adoption of advanced materials by high-volume, North American automakers,” he says. “The facility and resources at the Park let Momentive say to customers - look at what we can do for you here.”
Over the past two years, Western has been working closely with its civic, industrial and institutional partners to materially accelerate the contribution of the Western Sarnia-Lambton Research Park to the community and the country. Sarnia-Lambton is home to one of the richest energy, chemical and processing clusters in North America. Therefore, it is not surprising that some of the top global names in these industries now locate a portion of their business in this impressive facility. Moreover, the Western Sarnia-Lambton Park in partnership with local industry and Lambton College, has taken a leadership role nationally in the advancement of bio-industrial, water treatment and environmentally sensitive commercial technology.

The following articles provide a sampling of some of the many new advances and accomplishments taking shape at the Park.
LAMBTON COLLEGE

A true partner at the Western Sarnia-Lambton Research Park, Lambton College is bringing substantial technical expertise and assistance to the entire community of tenants in three key areas, among them water analytics, bioanalytics and a broad-based connection with various technologies especially important in the early stages of a venture.

One key to the Lambton College strategy can be described in two words: success enabling.

By reaching out to tenants who see the Research Park as their “open door” to the Sarnia-Lambton community and beyond, the Bluewater Technology Access Centre is one example of how Lambton College has become part of a success equation.

But that’s not where it ends.

The College also brings its significant expertise around water analytics through the Lambton Water Centre, also located at the Research Park. One of its projects involves helping the City of Sarnia advance its storm water management system with continuous flow sensing.

And finally, the Bioanalytical Lab, a Research Park asset that’s being operated by Lambton College, delivers a variety of services, all key to a group of companies—pioneers in the Canadian bio-industrial community.

In each of these initiatives, Lambton College is helping to fulfill its important academic mandate—providing students with hands-on learning opportunities—while bringing important expertise to the Research Park.

Taken together, the Bluewater Technology Access Centre, the Lambton Water Centre and the Bioanalytical Lab form the foundation of a significant partnership between the College and the Research Park.

GREENCORE COMPOSITES

You only have to spend a few minutes with the staff of GreenCore Composites, a Western Sarnia-Lambton Research Park tenant, to understand just how significant its transformative technology will be to companies now using conventional plastics to extrude a seemingly endless list of products for industrial and consumer use.

Think stronger, lighter and eco-friendly.

That’s what GreenCore brings to fabricators who now rely on various blends of plastic—whether vinyl, polyurethane or other custom concoctions—for the multitude of sub-assemblies and components they produce for industry.

By blending wood in the form of processed cellulose, GreenCore’s trademarked NCell natural fibre reinforced thermoplastic is about to change forever the standard by which the plastics industry measures performance.

But it’s how that wood cellulose is transformed and incorporated into a precisely configured recipe for injection and extrusion molding applications that delivers the performance that is grabbing the attention of GreenCore customers.

Consider for a moment: at just 40 percent fibre content, GreenCore will double the strength of virgin polymer while improving the eco-friendly nature of the end product.

It gets even better: GreenCore’s products will perform at least as well as the only technical alternative—glass fibre reinforced composites that are more expensive and, worse, abrasive to the point where dyes that cost thousands of dollars to replace wear out in record time.

Things continue to look good for GreenCore. Its Research Park presence includes a “mini-plant” that is producing product for at least a dozen trials for major potential customers.
BIOAMBER

When BioAmber began in earnest its journey to design and build a commercial plant for the production of bio-based succinic acid, an important building block for a wide range of chemicals used in products essential to everyday life, it needed a base of operations.

BioAmber found the ideal Sarnia home in the Western Sarnia-Lambton Research Park, where BioAmber has leased offices.

The relationship with the company and the Research Park pre-dates even its tenant relationship, when BioAmber was undertaking its site selection for the plant it is building in Sarnia.

“We see the Research Park as a one-stop shop that brings the entire capability of Western to us in one place,” says Anne Waddell, BioAmber’s Vice President of Government Affairs, who is based at the firm’s Montreal headquarters. “Having the key services we need here has been incredibly helpful to us as this project continues to move forward.”

Waddell points to the involvement of groups such as Bioindustrial Innovation Canada (also located at the Research Park), along with the Sarnia-Lambton Economic Partnership, and the Sustainable Chemistry Alliance as key to BioAmber’s sense of a welcoming environment in the Sarnia area.

“It’s a great place for us to start out and a great place to work,” says Waddell. “BioAmber Sarnia is delighted to be part of the corporate community in Sarnia. And we see a great advantage in the links we’ve been able to forge with members of the Research Park community.”