Building the intelligence layer for molecular measurement

Nanophotonic sensors enabling continuous, real-time molecular insight beyond the laboratory. laboratory.

01
LIGHT
Photonic input

02
OPTICAL SENSOR
Nanophotonic interaction interaction

03
PHYSICS-INFORMED INTELLIGENCE
Signal interpretation

04
MOLECULAR INSIGHT
Real-time measurement

Current measurement systems are laboratory-bound. We are building the sensing infrastructure that enables continuous molecular continuous molecular intelligence.

Critical molecular information is trapped inside laboratories

Billions are spent on laboratory-based molecular analysis, yet biological and industrial processes remain monitored monitored intermittently.

CURRENT WORKFLOW

01 Sample collection

↓

02 Transport

↓

03 Large analytical instruments

↓

04 Expert interpretation

↓

05 Delayed decisions

PROBLEMS

- Expensive instrumentation
- Slow turnaround times
- Limited continuous monitoring

INITIAL APPLICATIONS

Biopharmaceutical manufacturing	Healthcare monitoring	Environmental sensing

Three technology breakthroughs make this possible today

Independent advances converging into a single sensing paradigm.

01

Nanophotonics

Advanced optical structures enhance light–matter interaction, enabling highly sensitive measurements in compact form factors.

OPTICAL PHYSICS

02

Materials Engineering

Functional materials enable selective molecular interactions and improved sensing performance in complex environments.

FUNCTIONAL SURFACES

03

Machine Learning

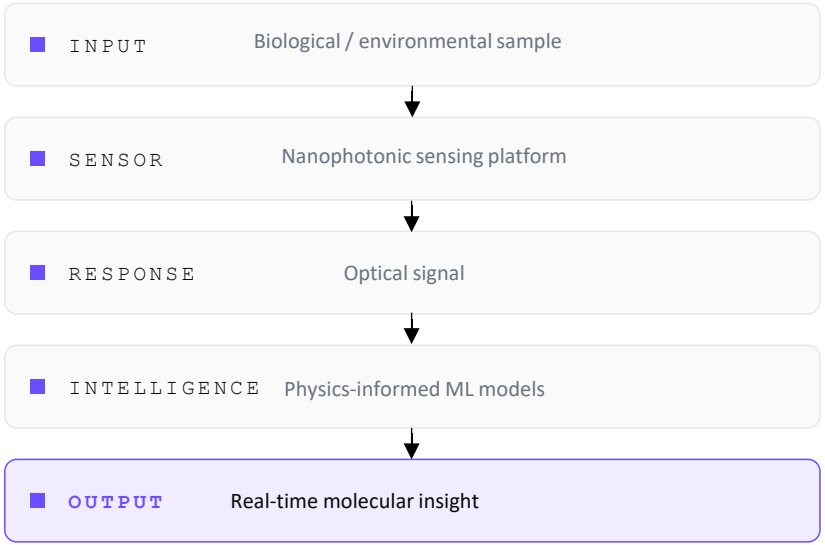
Physics-informed AI converts complex optical signals into reliable quantitative molecular information.

INTELLIGENCE LAYER

THE CONVERGENCE OF PHOTONICS, MATERIALS SCIENCE, AND AI CREATES A NEW SENSING PARADIGM.

A compact intelligent optical sensing platform

ARCHITECTURE



KEY BENEFITS

01
Compact
Fits where laboratory instruments cannot.

02
Sensitive
Uses engineered optical interactions interactions for enhanced detection. detection.

03
Continuous
Enables monitoring instead of intermittent testing.

04
Intelligent
Transforms signals into actionable actionable information.

Combining fundamental physics with intelligent sensing

Three layers of capability, integrated into a single sensing platform.

LAYER 01

Optical physics

- Nanophotonic cavities
- Enhanced light–matter interaction
- High sensitivity optical measurements

LAYER 02

Materials engineering

- Functional sensing interfaces
- Molecular interaction optimisation
- Selective analyte response

LAYER 03

Physics-informed intelligence

- Signal interpretation
- Calibration under real-world variation
- Robust molecular prediction

Our advantage is not only detecting signals, but converting complex optical responses into reliable molecular information.

Built by a researcher whose career has converged on molecular sensing

TM

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FOUNDER · PHOTONDX

University of Oxford

DPhil Researcher — Materials / Nanophotonics

BACKGROUND

- MEng Materials Science & Engineering, Imperial College London
- Research expertise in nanophotonic optical cavities and light–matter interactions
- Experience developing graphene field-effect transistor (GFET) biosensors
- Experience developing optical sensing platforms
- Development of physics-informed machine learning models for sensing applications

FOUNDER–MARKET FIT

A decade of research across materials, photonics, biosensors, and intelligent sensing systems leading toward leading toward commercial molecular measurement technology.

Starting where real-time molecular monitoring creates immediate value

BEACHHEAD

Biopharmaceutical manufacturing

TARGET CUSTOMERS

- Biopharmaceutical manufacturers
- Contract development and manufacturing organisations (CDMOs)
- Process development laboratories

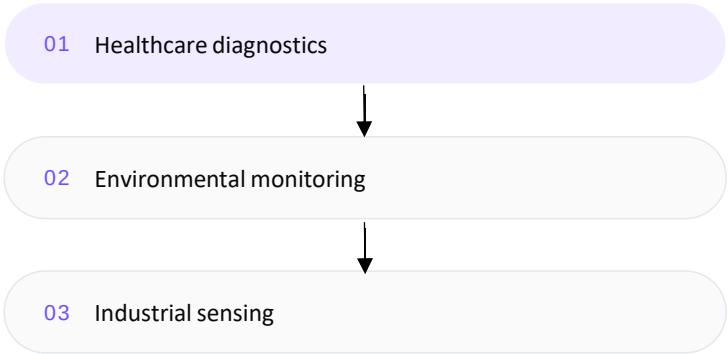
CURRENT CHALLENGE

- Critical process variables measured intermittently
- Manual sampling creates delays
- Limited ability to optimise processes continuously

OUR OPPORTUNITY

- Better process control
- Reduced manufacturing uncertainty
- Improved efficiency

EXPANSION



From biopharma beachhead toward the sensing infrastructure layer.

Molecular intelligence is a foundational layer across across industries

A single sensing platform can unlock multiple high-value markets.

INITIAL

01

BEACHHEAD

Biopharmaceutical manufacturing

Continuous monitoring of critical process variables where intermittent sampling creates creates the most value loss today.

EXPANSION

02

ADJACENT

Healthcare monitoring

Real-time molecular insight for clinical and and point-of-care applications beyond centralised laboratory workflows.

EXPANSION

03

BROADER

Industrial and environmental environmental sensing

Continuous molecular detection across industrial process control and environmental environmental monitoring at scale.

PhotonDx aims to become the sensing infrastructure layer for molecular intelligence.

Hardware platform with recurring intelligence intelligence revenue

Capital-efficient deployment with proprietary data advantage.

STREAM 01

Sensor hardware

Initial deployment of the nanophotonic sensing platform into customer environments.

- Sensor deployment
- Integration engineering
- Calibration and implementation

STREAM 02

Data intelligence layer

Recurring software and analytics revenue built on proprietary sensor datasets.

- Analytics
- Calibration models
- Application-specific prediction models
- Monitoring software

The sensing infrastructure layer for molecular intelligence.

A multi-layer technology moat

DEFENSIBILITY

01	**Scientific IP** Novel optical sensing architectures.	DEFENDED THROUGH PATENTS
02	**Engineering know-how** Fabrication, optimisation, integration.	DEFENDED THROUGH PROCESS EXPERTISE
03	**Proprietary datasets** Optical signals linked to molecular measurements. measurements.	DEFENDED THROUGH ACCUMULATED APPLICATION DATA
04	**Application-specific models** Physics-informed models developed for real-world conditions. conditions.	DEFENDED THROUGH TECHNICAL KNOW-HOW

WHY IT MATTERS

Competitors can build sensors. Building the the complete sensing intelligence platform requires years of accumulated scientific expertise, engineering knowledge, and application data.

Existing approaches trade off sensitivity, size, cost, and continuous operation

A superior combination across all four dimensions.

CATEGORY: TRADITIONAL

Laboratory instruments

FORM	Large
CAPABILITY	High accuracy
COST	Expensive
MODE	Offline measurements

CATEGORY: CONVENTIONAL

Conventional sensors

FORM	Small
CAPABILITY	Limited molecular capability
MODE	Point measurements
INTELLIGENCE	Minimal intelligence

CATEGORY: PHOTONDX

Our platform

FORM	Small to Miniaturised
CAPABILITY	Molecular sensing capability
MODE	Continuous operation
INTELLIGENCE	Physics-informed intelligence

From scientific breakthrough to commercial sensing platform

18–24 month milestones toward seed-stage scaling.

PHASE 01

Technical validation

- Prototype development
- Sensor architecture
- Fabrication
- Optical validation

PHASE 02

Application validation

- Target molecule demonstrations
- Industry testing
- Customer partnerships

PHASE 03

Commercial readiness

- Pilot deployments
- Manufacturing pathway
- Seed-stage scaling

Raising $2M to transform deeptech research into a commercial platform

$2M
PRE-SEED RAISE

18–24
MONTHS RUNWAY

PRE-SEED
STAGE

USE OF FUNDS

01 Technology development
Prototype fabrication, optical systems, materials optimisation.

02 Team
Core engineering and scientific hires.

03 Validation
Application testing and industry partnerships.

04 IP & operations
Patent strategy and company foundation.

This round bridges the gap between Oxford-developed nanophotonic technology and commercial deployment.

Validated sensing platform ready for industrial pilots and seed-stage scaling.