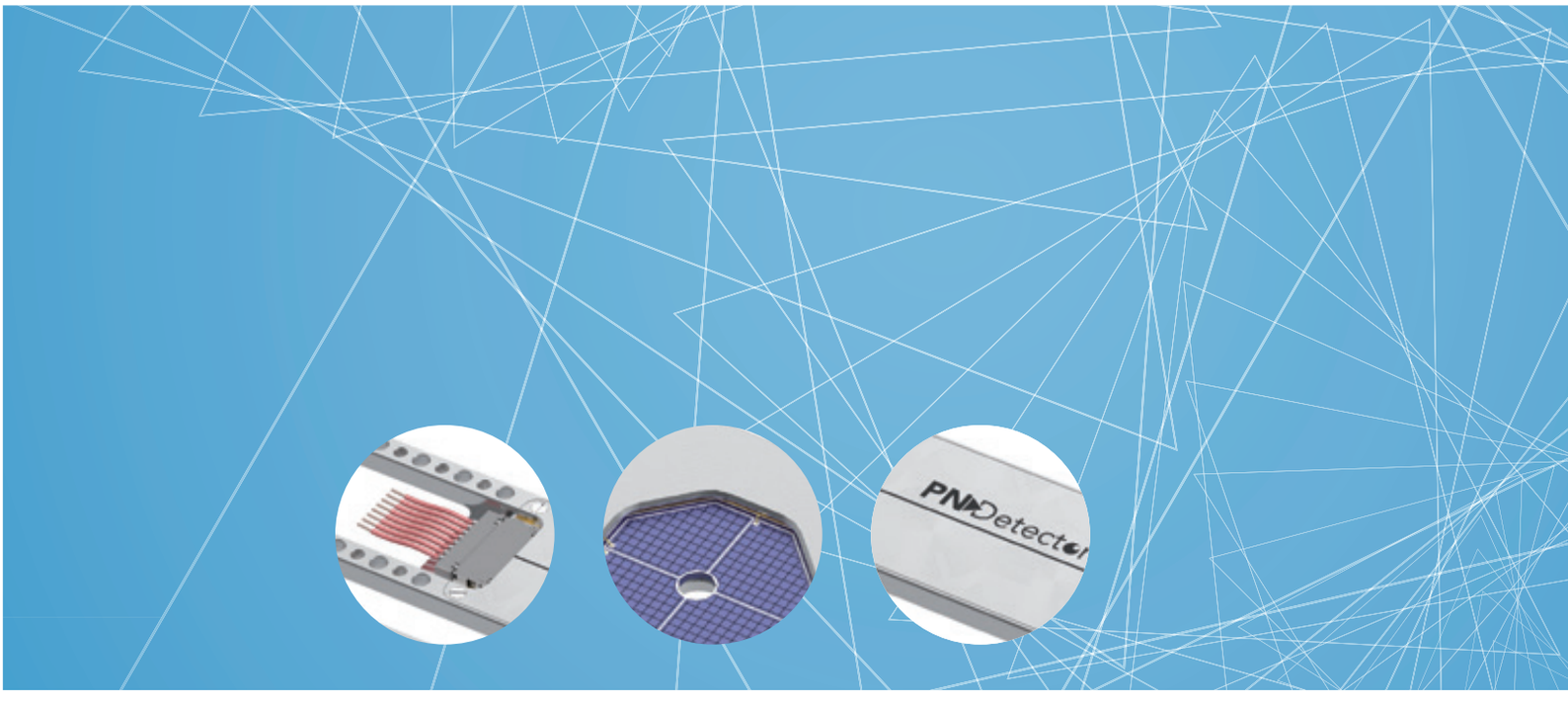
ADVANCED SILICON DETECTORS
FOR ELECTRON IMAGING & COUNTING



PNDetector

ABOUT

PNDetector was founded in 2007 as a sister company to PNSensor, with an emphasis on producing innovative and efficient radiation detectors for microanalysis, quality assurance and materials science. Our focus is on developing optimized sensors suited to the individual needs of our customers.

We are fabricating in our own cleanroom facilities at the Siemens technology campus in Munich, Germany. The cleanroom (600 m^2) is a sophisticated facility dedicated to the high quality fabrication of modern radiation detectors. The cleanroom design is optimized to permit a continuous and efficient production flow starting from the raw material, 6-8 inch high purity silicon wafers, to the finalized product.

The emphasis in production and development is on Silicon Drift Detectors (SDDs) and Charged Coupled Devices (pnCCDs).

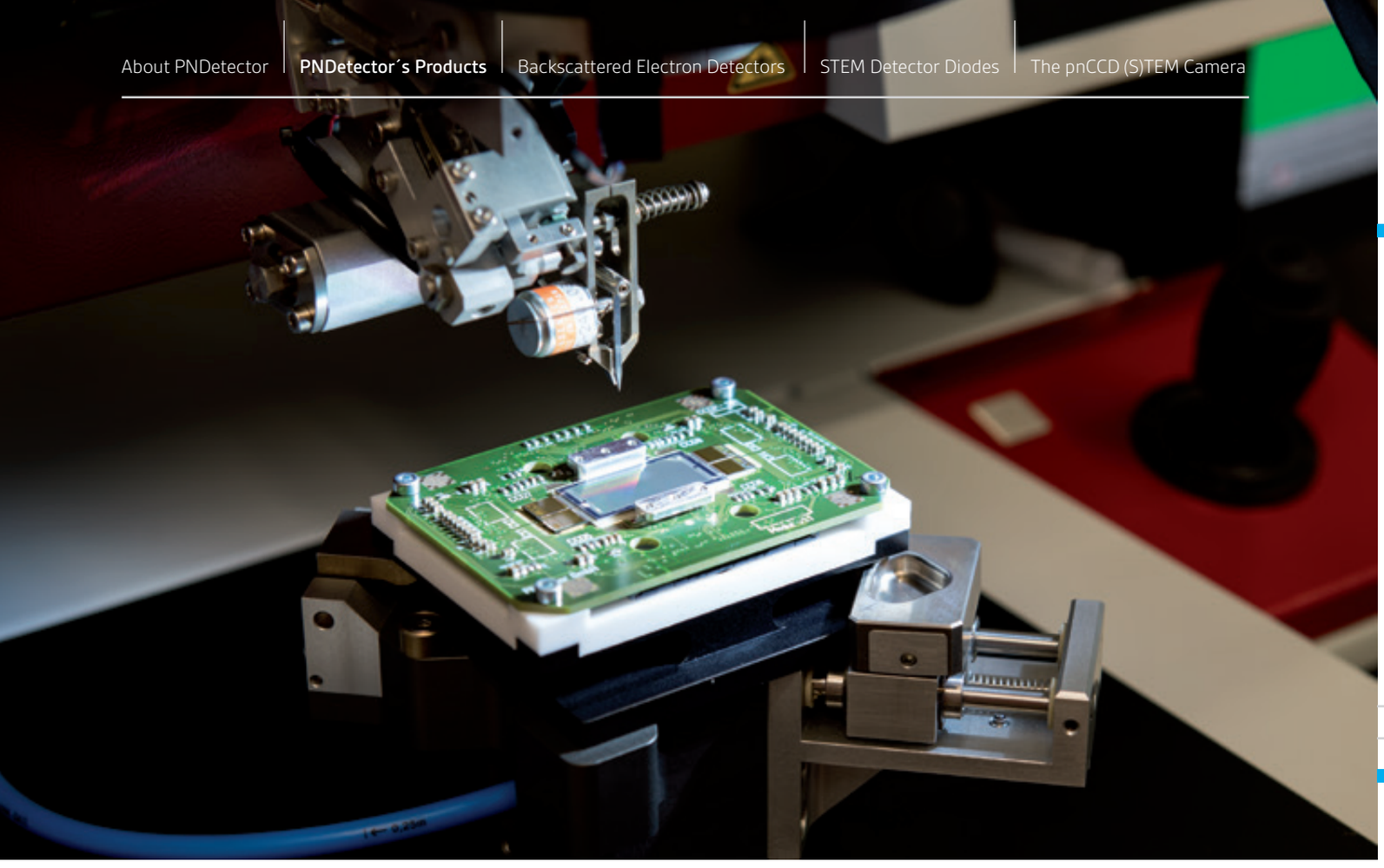
PNDetector distributes its products worldwide to OEM customers. We offer serial production as well as individual solutions - both prepared with accuracy and carefulness. Ideas, new developments, production and sales all fulfill PNDetector's sophisticated demand on premium quality.

PNDetector's SDDs are at the forefront of radiation detector technology, as they combine both excellent energy resolution and short processing times. Besides common, single chip configurations, we build monolithic multi-element SDDs and large area SDDs, including unique geometries with maximum solid angle. The SDDs are used in a wide variety of instruments, such as the Scanning Electron Microscope (SEM), Transmission Electron Microscopy (TEM) and X-ray Fluorescence Devices (XRF and TXRF).

Recently, PNDetector introduced a compact pnCCD camera system for high speed X-ray spectral imaging for XRF or ultra-fast direct electron detection in TEMs.

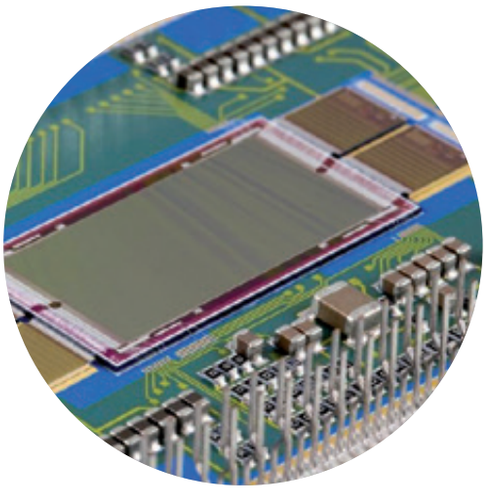
The continuous improvement of the performance of our detectors and the development of further new and advanced sensors is an ongoing effort of our company.





PRODUCTS

PNDetector´s Products for Electron Imaging & Counting



The **Silicon Drift Detectors** from PNDetector are well-known, broadly used premium detectors in X-ray microanalysis, enabling high resolution, high count rate X-ray spectroscopy. In recent years, we have been working on the strengthening of our technology core competences, such as very low leakage currents, small signal capacitance, and fast readout concepts integrated on chip level. The combination of the existing detector technology together with innovative ideas and new developments has led to **electron detectors** with **superior perfomance** in detection efficiency, noise, and speed, to be used either for **counting** or for **imaging** applications.

In this sense, **electron detector diodes** have been developed for Backscattered Electron (BSE) detection in Scanning Electron Microscopy (SEM) for measurements in Scanning Transmission Electron Microscopy (STEM). Beyond that, a **completely new camera concept** for applications in both **TEM** and **STEM** has been set up. Based on a **pnCCD**, the new camera presents a pixelated, fast and, direct electron imaging and counting detector.

Backscattered Electron Detectors

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providing TV speed imaging with low noise characteristics

- ultra flat module design
- integrated preamplifier for minimum signal rise times
- excellent collection efficiency

STEM Detector Diodes

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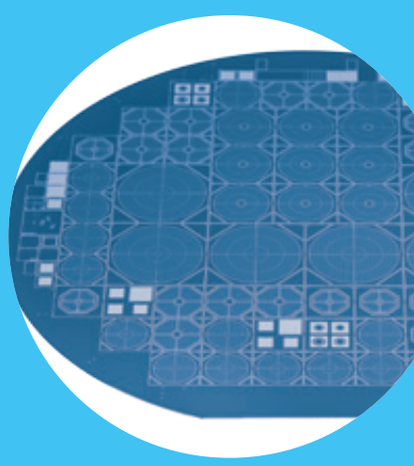
enhancing BF, ADF and HAADF analysis

- various different segmented annular design
- small signal capacitance and low leakage currents
- customer oriented detectors



The pnCCD (S)TEM Camera

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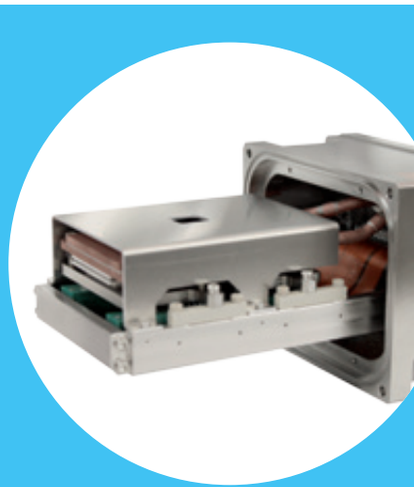
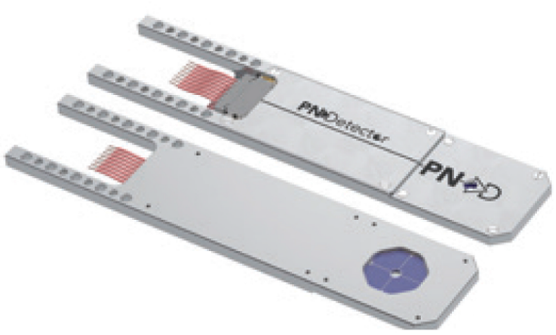
pioneering 4D STEM and fast TEM imaging

- direct electron detection
- superior readout speed
- unmatched radiation hardness
- low noise and single electron sensitivity



BACKSCATTERED ELECTRON DETECTORS

Key benefits



The new design of PNDetector's Backscattered Electron Detector with integrated preamplifier electronics is elegant and flat. It provides fantastic high speed images with strong contrast.

- **High collection efficiency**
  Increased signal intensities
  with our optimized chip tech
- **Excellent detection speed**
  Signal rise times < 100 nsec enable
- **Ultralow noise characteristics**
  The small dark current and signal cap
  less 1 nA and 3 pF provide ultra-low n
  samples
- **Easy access to custom specific s**
  Our own silicon fabrication facilitie
  degree of freedom for custom designs

We supply BSE detector chips with differ
Geometric collection efficiencies up to 50%
2 - 3 times larger signals compared to many c
Our BSD module uses **integrated preampli**
ted to the detector chip to minimize stra
detection speed. The package is very fl
into any SEM. In addition to our stand
to build customized detector soluti
assembly of the detector chip, carri
nics. Please don't hesitate to ask
ask for a quote for one of our

Annular Silicon Backscattered Electron Detectors

	Total active area	No. of quadrants / rings	Central hole diameter	