DESCRIPTION

*Vacuum* is an international rapid publications journal with a focus on short communication. All papers are peer-reviewed, with the review process for short communication geared towards very fast turnaround times. The journal also published full research papers, thematic issues and selected papers from leading conferences.

A report in *Vacuum* should represent a major advance in an area that involves a **controlled environment** at pressures of one atmosphere or below.

The scope of the journal includes:

1. **Vacuum**: original developments in vacuum pumping and instrumentation, vacuum measurement, vacuum gas dynamics, gas-surface interactions, surface treatment for UHV applications and low outgassing, vacuum melting, sintering, and vacuum metrology. Technology and solutions for large-scale facilities (e.g., particle accelerators and fusion devices). New instrumentation (e.g., detectors and electron microscopes).
2. **Plasma science**: advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.
3. **Surface science**: surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.

The aim of the short communications is to enable researchers to rapidly share their most exciting work with their colleagues. The expected time from submission to final decision is approximately 6.4 weeks.

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Surface Scientists, Materials Scientists.

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INTRODUCTION

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The scope of the journal includes:

1. Vacuum; original developments in vacuum pumping and instrumentation, vacuum measurement, vacuum gas dynamics, gas-surface interactions, surface treatment for UHV applications and low outgassing, vacuum melting, sintering and vacuum metrology. Technology and solutions for large-scale facilities (e.g., particle accelerators and fusion devices). New instrumentation (e.g., detectors and electron microscopes).

2. Plasma science; advances in PVD, CVD, plasma-assisted CVD, ion sources, deposition processes and analysis.

3. Surface science; surface engineering, surface chemistry, surface analysis, crystal growth, ion-surface interactions and etching, nanometer-scale processing, surface modification.


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Vacuum will consider three types of peer-reviewed manuscripts:

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Units to be used in 'Vacuum'
Pressure: Authors are asked to use bar (bar), millibar (mbar) or the pascal (Pa).
The SI unit of pressure is the pascal (Pa), the special name for the newton per square metre (N m⁻²). The standard atmosphere (atm) is defined in ISO 31/111-1978 (E) as exactly 101.325 kPa. The standard atmosphere should only be used to define a reference environment and not as a pressure unit. The 'bar' has become widely used as a unit of pressure in vacuum measurement.

1 bar = 10⁵ Pa exactly
1 millibar (mbar) = 100 Pa exactly.

Other units of pressure are sometimes to be found in published literature but their use is deprecated in ISO 31/111-1978(E) and in some countries their use is unlawful for certain purposes. A table of conversion factors for such units is given below to allow authors to change their units to pascals or millibars.
The pascal can be combined with other SI units to give the units for other quantities commonly measured in vacuum science and technology. Some examples of these quantities are given below.

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The SI unit for volumetric rate of flow such as is used when expressing the speed of a vacuum pump is cubic metre per second (m³ s⁻¹). The speed of most mechanical pumps is expressed in terms of cubic metre per hour (m³ h⁻¹).

1 m³ h⁻¹ = 1/3600 m³ s⁻¹ 0.000278 m³ s⁻¹).
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1 l s⁻¹ = 10⁻³ m³ s⁻¹.

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1 (1) Quantity measured in (2) Multiply by (3) Resulting number in (4) Multiply column (3) by (5) Resulting number in torr 133.322 Pa 0.01 mbar mm Hg 133.322 Pa 0.01 mbar micron 0.133322 Pa 0.01 mbar technical atmospheres (kgf cm⁻²) 98.0665 kPa 10 mbar m⁻³ h⁻¹ 0.000278 m³ s⁻¹ l s⁻¹ 0.001 m³ s⁻¹ torr l s⁻¹ 0.133322 Pa m³ s⁻¹ 10 mbar l s⁻¹ standard atmosphere (cm³ s⁻¹) 0.101325 Pa m⁻³ s⁻¹ 10 mbar l s⁻¹ torr l s⁻¹ cm⁻² 1333.22 Pa m⁻³ s⁻¹ m⁻² 0.001 mbar l s⁻¹ cm⁻² Table of conversion factors
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