

<b>Zeitschrift:</b>	L'Enseignement Mathématique
<b>Herausgeber:</b>	Commission Internationale de l'Enseignement Mathématique
<b>Band:</b>	25 (1979)
<b>Heft:</b>	1-2: L'ENSEIGNEMENT MATHÉMATIQUE
<b>Artikel:</b>	RECENT PROGRESS IN THE THEORY OF MINIMAL SURFACES
<b>Autor:</b>	Bombieri, E.
<b>Kapitel:</b>	I. Introduction
<b>DOI:</b>	<a href="https://doi.org/10.5169/seals-50368">https://doi.org/10.5169/seals-50368</a>

### Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 07.08.2025

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

# RECENT PROGRESS IN THE THEORY OF MINIMAL SURFACES<sup>1</sup>

by E. BOMBIERI

## I. INTRODUCTION

In this talk I will report on some recent results in the theory of minimal surfaces. Many of them belong to the theory of higher dimensional minimal varieties and all of them are related to the point of view of Geometric Measure Theory and the Calculus of Variations. The important approach to the various aspects of the 2-dimensional Plateau problem provided by harmonic maps and the Hilbert space setting, will not be treated here. I should also stress the fact that this report is not and does not intend to be a survey of all important achievements of the last years, but rather its purpose is to present a few recent results connected with the central problems of the theory, namely existence, uniqueness and regularity of solutions to the Plateau problem from the point of view of the Calculus of Variations.

## II. CURRENTS AND VARIFOLDS

Let  $U$  be an open set of  $\mathbf{R}^n$  and let  $T$  be a distribution on smooth differential  $m$ -forms  $\varphi$  with compact support in  $U$ . The boundary of  $T$  is the distribution defined by  $(\partial T)(\psi) = T(d\psi)$  where  $d$  is the exterior differential; clearly  $\partial T$  is a distribution on  $(m-1)$ -forms. If  $T$  and  $\partial T$  are continuous with respect to the  $L^\infty$  topology on forms, one says that  $T$  is locally normal, and if in addition  $T$  has compact support in  $U$  one says that  $T$  is normal. Normal currents form a Banach space in the following way. Let  $M(\varphi)$  be a norm on  $m$ -forms, and let  $M(T)$  be the dual norm

$$M(T) = \sup \{T(\varphi); M(\varphi) \leq 1\};$$

then  $N(T) = M(T) + M(\partial T)$  is a norm in the space of normal currents. There is a very special norm on forms, called comass, such that the dual norm, called mass, coincides with  $m$ -dimensional area in case  $T$  is integra-

<sup>1)</sup> This article has already been published in *Contributions to Analysis*, papers communicated to an international Symposium in honour of A. Pfluger, ETH Zürich, April 1978. Monographie de l'*Ens. Math.* N° 27, Genève 1979.